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ABSTRACT

The basic authorities and procedures of budgeting for higher education in California and several major issues raised during the course of budget hearings held in 1976 and their respective resolution are discussed. The issues were raised for the most part in appropriations under consideration for the University of California, although most of them had implications for the other segments of higher education in California. The following issues were addressed: enrollment levels, faculty salaries, research and public policy, educational opportunity programs, and the California Postsecondary Education Commission. Observations and conclusions about the budgetary process on the state level are offered, and future implications of the process on higher education in California are considered. Examples illustrative of the range of research results produced by the University of California's research programs are appended. (SW)

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The Making of a State Budget.

California's 1976-77 Higher Education Budget Hearings: Issues, Analysis and Inplications.

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July 1976

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This paper will describe the basic authorities and procedures of budgeting for higher education in California. It will also describe several major issues that were raised during the course of budget hearings and their respective resolution. Finally, it will offer some observations and conclusions about the budgetary process on the state level and suggest future implications of that process on higher education in California.

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California's 1976-77 Higher Education Budget Hearings

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<u>The More Effective Use of Resources</u> 1972

I have spent much of this semester watching the 1976-77 Budget Hearings of the Legislature of the State of California in Sacramento, as the higher education portions of the state budget passed through the process of public hearings before a subcommittee of the Assembly Committee on Ways and Means. To watch that process was to feel as well as hear the accuracy of the Carnegie Commission's words on the conflicts that will come to higher education over the more effective use of resources.

This paper will describe the basic authorities and procedures of budgeting for higher education in California. It will also describe several major issues that were raised during the course of budget hearings and their respective resolution. Finally, it will offer some observations and conclusions about the budgetary process on the state level and suggest future implications of that process on higher education in California.

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they are reviewed and where informal hearings and meetings take place with representatives of UC and CSUC.

The Governor and cabinet, principally this year the state Department of Finance, then make final budget recommendations and decisions and the whole budget is drawn together and presented as the Governor's Budget to the Legislature. The Legislature then holds public hearings into the merits of any given item in the budget and also prepares a detailed analysis of the entire budget to be used during the hearings by the Office of the Legislative Analyst. This annual Budget Analysis contains a detailed budget history and cost analysis of the Governor's Budget along with recommendations that the staff of Legislative Analyst's office may make concerning items in the budget.

These recommendations and analyses are prepared independently of either the Governor's Office or the statewide offices of UC or CSUC especially for the use of the Legislature during budget hearings and often raises questions of cost effectiveness and program history not mentioned in other budget documents.

The Legislature considers budgets of the various segments of postsecondary education separately. The Governor's Office, Department of Finance and Legislative Analyst all have different staff personnel to analyze the budgets of the various segments. The segments also each have staff

specialists whose task it is to provide expert commentary and justifications on various aspects of their segment's budget in testimony before the legislature. (In the case of UC this person is a Vice President of the university and his associated staff. In the case of CSUC this person is a Vice Chancellor and his associated staff.) Statewide faculty, employee and student groups also monitor the budget items of most interest to them and are prepared to give testimony before the legislature on budget items that effect their respective constituents.

The public hearings consist largely of these various groups all providing commentary and/or expert testimony to the subcommittees of the legislature assigned to hear testimony and make decisions concerning the education portions of the state budget. These hearings take place in parallel, with one set coming before a subcommittee of the Assembly Committee on Ways and Means and another set coming before a subcommittee of the state Senate Committee on Finance. In such fashion each interested party has at least two opportunities to present arguments in justification of the position they hold in respect to specific items in the higher education budget.

There is seldom agreement on any given budget item or appropriation. Often the Governor's Budget recommendations will disagree with those of the Legislative Analyst, with

each side presenting conflicting arguments to justify their position. Each segment will comment on the Governor's Budget and the Report of the Legislative Analyst at some length, citing disagreements, justifications, and sometimes asking the Legislature for augmentations to the Governor's proposals.

The hearings thus develop into an elaborately choreographed ritual as each individual budget item comes up for consideration. First, the Governor's Office and/or Department of Finance will comment on the item, followed by the representative of the Legislative Analyst. Second, the university representative (or other segmental representative) will be asked to comment or to give testimony often with the help of someone from the particular program in question. Third, representatives of the statewide academic senate and/or other faculty organizations will comment, many times followed by the representatives of the statewide student lobby and/or student government organizations. Finally, after all the organizational representatives have commented, other public testimony and/or opinions will be sought. Typically these comments will be made by community representatives from college communities affected in some way by the proposed budget.

In this way does the legislature seek public input into the formulation of the higher education budget for the state

of California. Once all the testimony has been taken, which this year took place over the period from March 28, through May 17, 1976 in the Assembly, and a parallel period in the Senate, the subcommittees assemble again for decision making hearings. These too, are open to the public, but only upon request of the sub-committee is further testimony taken. In these hearings members of the legislature debate among themselves the merits of the proposed budget, often asking specific questions of representatives of the Governor's Office, Legislative Analyst's Office and segmental and organizational representatives as they make up their minds concerning specific items, which are then put to a vote in the sub-committee. A simple majority, which in the case of the Assembly subcommittee is <u>three</u> of the <u>five</u> members of the subcommittee, then approves or defeats specific budget items. The approved items then collectively make up the Assembly subcommittee passed version of the Budget Bill, (which is the Governor's Budget introduced by an Assemblyman and Senator for the purpose of debate and approval.) Many items have changed since the first Governor's Budget has been submitted. For all practical purposes the Governor's budget ceases to exist at this point, and in its place is the budget as passed by the Assembly subcommittee with amendments, augmentations, and changes in language made in the course of the subcommittee hearings and debate. (Of course a parallel process has taken

place in the State Senate, where a similar document has been compiled in the same manner.) This budget then passes on to the full committee for approval which is automatic for the most part, unless some member of the full committee is extremely unhappy with some portion of the bill that particularly affects his or her district, although this is rather unlikely since most of those concerns would have been dealt with at the subcommittee level. The subcommittee makeup has reflected the various political and power alignments in the legislature for the year (membership of the education subcommittee was made up of three Democrats and two Republicans with the chairman of the subcommittee indirectly appointed by the Speaker of the Assembly, and thus reflects in microcosm the organization of the Assembly, again with a parallel on the Senate side, which anticipates for the most part how voting approval for any given issue considered will take place.) These alignments represent voting strength and party representation and from an organizational standpoint determine how the legislature will function. This is an organization arrangement as much or more than a partisan one, designed by a process of political give and take and/or compromise to enable the legislature to function and make decisions about the business of the state that comes before it. While the members of the legislature are made up of representatives of the political parties, the process

of hearings and decision making is not easily recognizable as a partisan process. Issues in debate are much more likely to reflect regional and geographic interests than political party interests, at least at the subcommittee level. Party interests are raised at the conclusion of this process, when the final vote on the budget is taken in the legislature for example, but not formally at least prior to that time. (As an observer of the hearing process it was often difficult to tell a legislator's party affiliation without knowing it in advance, because it most certainly was not discernable from what was said.)

The matter of specialization of a legislator's interests also plays a significant role in both committee assignments and discussion and debate leading to the final budget bill. Among the 80 member Assembly and the 40 member Senate each member will have perhaps three or four committee assignments representing his or her areas of interest, expertise or both. Subcommittee assignments will reflect greater specialization and will overlap with budget oversight in those same areas of interest. Given the complexity of the state budget a large amount of mutual trust and understanding is allowed among the members of the legislature within their areas of interest and expertise such that the recommendations of a legislator and/or subcommittee concerned with a particular area of the state budget are understood to be the product

of specialized interest and scrutiny and as such are passed upon with the knowledge that the subcommittee report represent a relative synthesis of expert opinion. Thus, subcommittee recommendations rarely fail to pass the full committee, and for practical purposes represent final decisions on the part of the Assembly and Senate on any given budget item.

Once the parallel process of approval of a budget bill has taken place in the Assembly and Senate, differences are resolved in a conference committee, that again proportionately represents powers and parties within the legislature. Where there are differences in the budget bill passed by either house, the conference committee will resolve them, and that resolution will become part of the final budget to be voted on and passed by the legislature.

Where there are no differences in the bill as approved by both houses of the legislature, the conference committee will take no action. The conference committee is often used as the arena to resolve significant disagreements over budget policy or appropriations. Conference committee hearings are closed, with only legislators, on and off the committee, having the opportunity to give testimony before this body. Often one house will deliberately pass a different version of a particular item in the hope that the conference committee, with time pressures and political pressures at a maximum, will resolve the disputed item in their favor.

Disputed items thus become "chips" in the process of trade-off and approval that takes place in the conference committee.

After the conference committee has assembled a compromise budget bill it then goes back to the legislature where it is passed by both houses and forwarded to the Governor for signature or veto. It is at this point that several constitutional issues with respect to the higher education portions of the budget are raised. The Governor may sign the budget bill or line item veto particular items. The Legislature can override gubernatorial vetos only with a two-thirds majority of both houses. While this has happened, it is not a common occurance, especially when the governor's office and legislature are controlled by one party.

Constitutional Authorities

Both the University of California and the California State Universities and Colleges are state institutions, created under the constitution of the State of California, but each operates under a different set of state statutes, resulting in significant differences in the way their budgets are approved by the Governor and executed by their chief officials and governing boards. The University of California is a constitutional status university and the California State University and Colleges are a university system created by state statute as described by Glenny and Dahlgreen

(1973) in their recent study of public universities and constitutional autonomy.

The University of California operates and is governed under a section of the state constitution, giving the Regents of the University of California authority to govern and operate the university as a public trust. Regents are appointed for 12 year terms (formerly 16 year terms) by the Governor, and they have near complete control of the budget of the university as a part of their general authority. The Regents set fees, salaries, and determine final budgets. Formally, it is the Regents who formulate and submit the budget bill from the legislature as approved by the representatives of the public. In the case of the University of California, the Governor receives a budget consisting for the most part of a large lump sum to be appropriated to the university. Some special programs and capital/construction expenditures are considered separately, but for the most part the budget is a lump sum derived in some cases by formula for operation of the University. At the point of the Governor's final approval he can veto specific items within that lump sum and also reduce appropriations within specific appropriations. His veto power is limited to some portion of that lump sum although the reduction of amounts within a line adds considerably to his power, but, regardless of approval or veto of some portion of the budget as recommended by the legislature,

the university, under its constitutional authority receives a lump sum from the state to operate the university. Ultimately, it is the regents, independ of the Governor (although the Governor is an ex-officio member of the Board of Regents) who decide exactly how that money is to be spent. Let me cite a hypothetical example: let us say that the budget bill as approved by the Legislature is for ten million dollars. The Governor for one reason or another is unhappy with a program of the university somewhere within that lump sum ten million that costs one million dollars. The Governor can cut the lump sum by that amount, if he so chooses, subject to legislative override of course, and if the cuts are not overridden, the university's budget is cut by that amount. However, that is no guarantee that the program out of favor with the Governor will be cut, for the Regents determine the final budget, and have additional non-state appropriated funds at their disposal from the universities endowment, research income, etc. and they can make the final determination of the university's budget after the Governor has made the decision as to what lump sum amount will come from the state budget. The Regents operating under their constitutional authority thus guarantee the independence of the university. Of course, continued disagreement between the Governor and the Regents over some period of time will play havoc with the orderly budget proceedings of all parties

concerned, and thus the rather complicated series of checks and balances, veto procedures, and the large number of public hearings and public involvement serve to make any radical changes in state policy toward university budgets difficult. There are some other economic considerations, dealing with the larger questions of benefits and outcomes, and from which segments of the total state economy the funds to support the university are coming from, but these questions are beyond the scope of this paper.

The California State University and Colleges were founded under state statute, as passed by the state legislature and signed into state law by the Governor. They do not appear in the constitution, and thus have their existence totally specified under state law. The CSUC system operates under these statutes, and is governed by a Board of Trustees appointed by the Governor in much the same manner as the Regents of UC. Unlike the Regents, however, the Trustees of CSUC function under state statute that specifies their duties and responsibilities, and particularly in regard to budgets these statutes provide for some major differences. The basic difference between CSUC and UC, and in general between state statute and constitutional status universities, is that the Legislature and Governor under the state statute retain power to determine budget policy on a line item basis. Thus, the Governor, when considering approval of the budget

bill as passed by the legislature can, in the case of CSUC institutions line item veto any expenditure in any program he might choose. CSUC budgets are not approved on a lump sum basis, although they do have provisions for formula based support based on the number of students, much like the university, but their budgets as considered by the legislature and approved by the Governor are far more detailed. In such a way the executive and legislative branches of government in California assert far more control over the budgets of CSUC institutions than they can over the budgets of the University of California.

This situation is a product of the differing statutes under which the two systems were founded and are governed. In practice it means that the Legislature and Governor keep relatively closer watch over programs and practices of the CSUC system than they might over the similar programs and practices of the UC system. But, given that both systems operate as a public trust, with publicly appointed regents or trustees and budgets that must pass the scrutiny of several levels of statewide agencies under the control of various branches of the state government, the differences in budget procedures and securing approval for budgets are on the whole slight. The UC system has an additional level of independence, and can initiate programs without the approval of the executive and legislative branches of the government.

The UC system also has a mandated greater role in research conducted within the state, and funds for that research, from both state monies, and outside sources make up much of the additional money that the regents have to work with in making up systemwide budgets.

There are additional constitutional issues and questions of constitution authority raised with respect to these constitutional authorities and budgetary procedures. The methods I have described so far are those that have evolved in practice from the founding of the UC and CSUC systems. There are, constitutionally speaking, differences of opinion on how the constitution of the state of California is to be interpreted, particularly with respect to the powers of the Regents of the University of California. These differences of opinion regarding interpretation of the constitution remain untested in a court of law, but they could be at any time, with uncertain result. Similar constitutional court tests have taken place in other states, with sometimes surprising results. Glenny and Dahlgreen (1973) cite the case of Utah, where state authorities challenged the independence of the Board of Examiners of the University of Utah. In that case, along with other similar cases in Louisiana and Missouri, the state supreme court ruled in favor of the state authorities, and thus removed portions or all of the constitutional authority and autonomy for those universities, and with them

the final authority to set budgets of the universities, making them in effect subject to the same kinds of procedures and controls that state universities operating under state statute are subject to.

Henderson (1971) notes that the University of California along with the University of Michigan enjoys the maximum amount of autonomy due to its constitutional status which subjects the university to legislative controls only "as may be necessary to insure compliance with the terms of the endowments of the University and the security of its funds." (California Constitution Article 9, Section 9). However, Glenny and Dalglish (1973) note that the constitution was amended in 1966 to read, "Notwithstanding any limitation or restrictions contained in this constitution, every state office, department, institution, board, commission, bureau, or other agency of the state, whether created by initiative law or otherwise, shall be subject to the regulations and requirements with respect to the filing of claims with the state controller and the submission, approval and enforcement of budgets prescribed by law." (California Constitution Article 13, Section 20) They argue that the university may well be subject to that section of the constitution were the applicability of that section ever tested in court.

These exact questions have not been tested in court in California, but they could be at some point in the future.

Other cases, not involving state funds have upheld constitutional autonomy in California. Currently, these issues are skirted in the matter of "budget language" in the budget bill as passed by the legislatures and signed by the governor. The Legislature is free to, and often does, insert language that specifies the university to act in some specific manner with respect to items within the larger lump sums of the budget appropriation to the UC system. Technically, the university feels at the present time that they are free to ignore, if they would so choose, those stipulations. In practice they do not. Such stipulations skirt very closely the questions of the constitutional autonomy of the university, but up to this point both possible parties to conflict have seen co-operation as a more fruitful path to tread. In times of severe budgetary crisis, such as those which are currently affecting the state of New York, the path of co-operation may be more difficult to follow. For now, in California, constitutional authority questions remain hypothetical.

Major Issues Considered During Budget Hearings

During the course of the public hearings held in the spring of 1976, prior to the adoption of the higher education portions of the state budget for the fiscal year 1976-77, several major issues in regard to budget policy were raised.

These issues were raised for the most part in appropriations under consideration for the University of California, although most of them had implications for the other segments of higher education in California. In this section of this paper I intend to describe several of these issues as they were discussed during the budget hearing, discuss the resolution of these issues, and discuss possible future implications of these issues.

Enrollment Levels

This issue probably received the greatest public notice of any single budget item in the past year. The University of California, because of increased and unexpected enrollment in the 1974-75 academic year, increased, over previous five year projections, the level of projected enrollment at both the undergraduate and graduate level within the UC system for the 1976-77 academic year. Since budget appropriations are based to a considerable extent on enrollment based formulas, this had the effect of increasing projects state monies to UC over previously projected levels. When these figures were presented to the Governor by the UC statewide administrators, he chose not to agree with them and, in effect, said that UC as far as he was concerned would have to live within it's earlier projected enrollments, and/or choose to fund space for additional students out of other

than state funds. At this point the University and/or Governor went public with the dispute (L.A. Times, 1/22/76) as the Governor's Budget was presented to the Legislature.

Unnamed University spokesmen claimed that the Governor's Office was, in effect, changing state policy by limiting enrollments at UC. Prior to this year's request the state's policy was to provide space, and state funds, such that all qualified students (the top 12.5% of all high school graduates meeting UC academic requirements) who wished to, could enroll at some UC campus. By saying that UC could have only so much state money to meet enrollment at x-level the Governor was changing this policy. The Governor's Office claimed that UC could quite easily fund those students if it so wished, and that it was their feeling that there was waste and iefficiency within the university. Putting a limit on state funds was one way to increase efficiency at the university. It was at this point that public hearings on the projected budget began.

After the traditional opening statement of President of the University of California, David Saxon, who made a summary presentation, and submitted as formal testimony detailed answers to questions posed by the Chairman of the Assembly Ways and Means subcommittee, (see appendix 2), the enrollment level issue quickly became the first order of business. UC's Vice President in charge of the Budget, Chet O. McCorkle

was called to testify, after a courteous and brief colloquy with President Saxon and the subcommittee, after which President Saxon left and the discussion became more heated. Vice-President McCorkle had prepared a summary of the controversy from the university's perspective, attempting to compromise with the Governor's Office on the issue of enrollment level, and pointing up the state policy implications of limiting enrollment. There then ensued a protracted and heated discussion between the members of the subcommittee, most of whom had considerable knowledge concerning state higher education policy, and Vice President McCorkle concerning the enrollment projections, in an attempt to compromise. It was the feeling of the subcommittee that if the meaning of Governor's budget was in effect to challenge state policy, then the University ought to stand by the position of defending current state policy and ask for full allocation of state funds to meet projected needs. The question of what would happen to those students enrolled in 1974-75 who accounted for a portion of the projected over-enrollment for 1976-77 was also very prominent in the discussions. It was one of the few times students, other than as figures on a budget projection were mentioned. The question of how UC went about limiting its enrollments was also raised. Neither of these questions were answered to the committee's satisfaction by the Vice President or his staff who were feeling quite beleaguered by this time. It was an awkward

and painful spectacle of frustration as neither the legislators or university representatives were able to reach agreement on even the full scope of numbers (and people) involved in discussion of enrollment levels. At this point the hearing was adjourned, and further public discussion was put off until additional material could be prepared (see appendix 3).

At the decision making hearings, some weeks later a compromise was reached and passed by the Ways and Means subcommittee, although the Senate Finance committee had passed a slightly different version, leaving final resolution to the budget conference committee. The assembly version of enrollment level funding allowed sufficient funds to fully fund the revised and refined university enrollment level figures submitted during the course of the public hearings. These figures represented a decrease from the original expanded enrollment figures that the Governor's budget had challenged, but an expansion above and beyond the Governor's budget sufficient to fund UC revised estimate of graduate and undergraduate enrollment levels for the 1976-77 academic year, and thus a defeat of the Governor's proposals. The state senate passed a similar proposal, but their version funded only the university's projected undergraduate enrollment levels. The compromise assured at the very least that all qualified undergraduates, as estimated by the university, would have places and funding assured by the state, and

thus, the state policy was upheld. It was obvious that the legislature felt very strongly about maintaining this state policy. It was also obvious that UC enrollment projections must be very carefully drawn, and that expansion of enrollment levels over projected long-term levels would be very closely watched in the future, especially given UC's presentation of three separate projections (of which the final, middle level was accepted) in the course of three months of budget manueverings.

The issue of enrollment levels was a question of state policy with respect to the quantity of higher education that should exist in California. It perhaps was not properly taken up in budget hearings for a particular year's appropriation without adequate background and research material available to all interested parties. But, lacking some more formal means of inquiry into this issue, the questions of state policy were taken up in the only forum available, the budget hearings.

During the interval between the end of the public hearing on budget appropriations and the decision making hearings when the amount of appropriations for enrollment levels was again taken up, it was evident from both the quality and tone of the discussion that much consultation had taken place between the university and the legislature. Thus, the political process worked, compromise was reached and announced, and

the question of enrollment levels, even though not completely resolved, was resolved sufficiently to allow the budgetary process to proceed for the year in question.

Further discussion and ultimate resolution was put off until another time and perhaps to the more appropriately equipped staff of the California Postsecondary Education Commission, (CPEC) (McCorkle 1976 Appendix 3.) Shunted aside were additional questions about what kinds of programs the university would continue to offer in meeting the need for a certain quantity of UC higher education in California. It was later revealed in the decision making hearing, that among the economies planned by the university to meet the compromised enrollment levels, would be an end to additional funding of UC's "Extended University" programs, which were intended to bring UC programs to part-time and evening students who, though qualified, could not take advantage of regular UC programs for economic reasons, thus confirming the recent Bowen, F., Glenny and Rayle observations that off campus programs for part time students were more likely victims of retrenchment than traditional residential programs. (Bowen, F., Glenny and Rayle 1976). This aspect of the enrollment level issue was not even discussed in the public hearings.

Faculty Salaries

This issue was of most concern to the faculty representatives from all of the organized academic groups throughout the state, regardless of their affilliation with any segment. In the Governor's Budget was a proposal to limit academic personnel salary increases to $65 per month. This was later amended by the Governor's Office to $70 per month. Both the Governor's Office and Department of Finance saw this proposal as a temporary salary adjustment, intended to give greater benefit to the lower salaried employees within the statewide systems. The UC and CSUC systems opposed this proposal. The Governor went on to propose this method of slary adjustments for all categories of state employees.

Public hearings on this question in the higher education portions of the state budget drew the most passionate testimony from a broad spectrum of academic employee representatives and statewide academic senate members. Academic representatives appeared in great numbers when there was any possibility of this issue being considered. Several alternative recommendations for percentage salary increases were prepared by various groups, including the systemwide UC and CSUC representatives. Ultimately this proved to be a question of statewide policy, not just affecting university academic employees, but state employees of all kinds. The budget hearings in respect to this aspect of the higher

education budget became a colorful and interesting preview to resolution of this issue before the full Ways and Means committee.

In actual testimony before the subcommittee, the Governor's representative claimed that in negotiations with major state employee groups, general acceptance of the proposal was gradually forthcoming. It was never clear if these major state employee groups included academic employees. The Governor's representative also maintained that the $70 per month across-the-board salary increase actually worked out, counting increased fringe benefits, to be the equivalent of something like an 8% salary increase. Prior to public testimony, the Legislative Analyst himself, A. Alan Post, came to present the findings of his staff. He first denounced the Governor's Office 8% salary increase claim, as a "mythical figure, having no basis, what-so-ever in fact." He then went on to describe his recommendations for a 9.8% salary increase for all state employees, based on cost of living increases, and comparisons with employees in private industry, in the manner that state salaries had traditionally been set. He argued that the state should not arbitrarily change the manner in which state salaries were set without undertaking serious study to determine the effects a change in the salary setting policy would have in the long term. He argued that the Governor's proposal was, in effect, pendlizing the better

paid and retiring employee's, and providing them little protection against inflation, which was a problem that those employees had not created. He ended with a plea to return to a more systematic method of determining salary increases.

Various academic representatives then testified to similar positions. Some argued for greater increases in salaries, citing comparisons with other universities and other states. No academic representatives supported the Governor's proposals.

Despite this overwhelming agreement, the subcommittee was not persuaded to support budget appropriations that would increase faculty salaries to a level greater than the Governor had proposed. In an informal vote, the committee favored the Governor's proposal by a majority of three to two. It was not the task of the education subcommittee to resolve this issue, for it affected a much broader range of sate employees. The full Assembly Ways and Means Committee later supported the proposal of the Legislative Analyst, to the effect that all state employee's, including academic employees, were proposed for a 9.8% salary increase. This was not, however, the final vote on this issue for the senate had passed the Governor's proposals and there was a good chance that his proposal would be adopted in the final version of the budget.

Research and Public Policy

This issue was concerned with the size, outcome, and usefullness of on-going basic research at the University of California, as the state's master plan designated research university. There is no specific state appropriation for research, rather support for research is an integral part of the general support category of appropriations from the state's general fund. This support is part of the large state appropriation that the Regents of the University have control of, and with respect to research, state funds are supplemented by Regent's funds and outside research grants, many of which provide the university with income, along with meeting specific research goals. The university maintains that state funds help support the university's general research capacity, and provide "working capital" such that the university's overall research capability is increased. The university's total research budget (state and outside funds) for the fiscal year 1976-77 is $60.5 million dollars.

The state legislature has indicated for the past several years a concern for the usefullness and dissemination of this research. Given such large sums of money devoted to non-specific appropriations, and given increasing state concern for solutions to state problems that require high degrees of research technology, (southern California's air polution problems are a specific example often cited), this appropriation

has received greater scrutiny in recent years. This year in separate proceedings from the budget hearings a bill (AB 4323 1976) was introduced in the legislature by the chairman of the Ways and Means subcommittee to provide state funds for a public policy research institute, with the objective of bringing research resources to bear on specific public policy problems under consideration by the legislature. In the budget subcommittee , as a separate procedure from AB 4323, it was proposed that up to one million of the university's research allocation be ear-marked for public policy research, and dissemination of that research.

The UC representatives were not in favor of such a proposal in any form. They saw any and all such mandating of the use of university research funds in specific areas as an attack on the integrity of the university's research programs. They did not wish any portion of the university's research appropriation, however small, to be specified for use by any outside agency, including the state legislature. When pressed on the subject, with the argument that within sixty million dollars of the state's public monies devoted to research, there ought to be room for less than 2$ of that money to go directly for research on needed public policy, the university threatened to retreat into concerns for academic freedom, which served in this case to confuse the discussion. The UC system seemed more concerned with this issue, than

any other that confonted it during this year's budget discussions. Briefly stated, the University's case was that their mission was basic research; no one could predict in advance the outcome of such research; and it was vital for the university's survival that no limitations of any kind be placed on funds allocated for research, most especially not by the state legislature, for that would suggest that the university was subject to political control. UC submitted extensive lists of the useful outcome of basic research carried out on its campuses, and suggested that it was quite willing to aid the dissemination process in any way possible, and had been expanding its programs to disseminate research findings.

Counter arguments on the part of legislators stated that; as representatives of the public they felt the need to have the best information and research possible on public policy matters that would affect all the people of the state. The university had the research capacity and the state mission to conduct research, and they did not see why specific requests could not be made of that research establishment by representatives of the public. Public hearings concluded at this point with each side, as far as public comment was concerned, digging in their respective heels on this issue.

Here, once again as with the issue of enrollment levels, was a question of state policy toward higher education, being

taken up during budget hearings. This may or may not have been the appropriate arena for such matters (and there were to be separate hearings in another committee on the Public Policy Research Institute Bill) but all the parties with interest in this issue were present, and the power to amend and/or control budget appropriations in this area, and in other areas of great interest to the university made public discussion of this issue mandatory.

Arrayed on opposite side in the discussions of this issue were the UC system's intense interest in preserving their independent research programs, and the most interested and expert legislators (and the most supportative of the university) in the area of higher education saying in effect that here was an expansion that they felt the university should make, and that they were prepared to authorize, even with university opposition. Thus it became a question, again, of state policy.

Six weeks after public discussion of this issue in the budget hearing, a compromise of sorts was agreed to and announced after what was obviously several weeks of discussion and the presentation of up to five separate alternative proposals, indicating the seriousness that all concerned parties gave to this issue. The university representative agreed that there was a need for public policy research and that the university was an appropriate agency to carry out that research. The university did want to be able to organize

and control whatever public policy research effort was undertaken in its name. The legislators agreed that the university could organize the effort, so long as it was recognized and carried out, and that the information gathered was systematically disseminated to maximum public discussion. $500,000 of university research funds was agreed by the university to be devoted to this effort, and the state would appropriate an additional $500,000 to these funds, of new state money, for research in this area. $100,000 of the university research funds was understood to be used for dissemination.

The art of compromise was again practiced in the resolution of this issue. State policy was altered, but only slightly, and the university retained control over the organization of research funded by the state and received additional research money to carry out additional tasks. The university stated that it would be carrying out this public policy research effort by devoting funds already allocated to this category of research but not necessarily organized as public policy research to this task.

Educational Opportunity Programs

This issue was common to all segments of the higher education budget in California. In general, the Governor's budget proposed increases of up to 50% in the level of state funding going to Educational Opportunity Programs (EOP) at

the various university, state university and community college campuses. EOP programs provide financial aid, special academic counseling/tutoring/advising programs, and special pre-college and outreach programs to students who meet certain specified levels of financial need. In addition to state funds, federal support and support from other college and university funds goes into these programs. These programs have been in existence since 1964, although they have not always received appropriations from the state general fund.

There was no opposition to the major thrust of the Governor's budget proposal, although the Legislative Analyst's Report questioned the amount of increases in some cases, and the ability of some campus programs to expand rapidly. Members of the Ways and Means subcommittee did not question the size of the program, so much as the administration of the programs and their geographic distribution. Public testimony from campus EOP directors pointed out the usefullness of the program and its continued usefullness in reaching and making available higher education to citizens who could not otherwise afford postsecondary education.

The control and administration of EOP programs at the systemwide level continued to trouble the legislators until the end of the decision making hearings. Finally, on the last day of the decision making hearings, a compromise was

propsed and accepted by the members of the subcommittee. The compromise accepted the Governor's recommendations for increased funding for EOP programs throughout the segments, but changed the distribution requirements for the "new money" increases in the Governor's proposal. Segmental representatives had previously promised close attention to statewide controls of these programs.

California Postsecondary Education Commission

The California Postsecondary Education Commission is the successor agency to the Co-ordinating Council for Higher Education and the official "1202" Commission for California under the provisions of the Federal Higher Education Amendments of 1972. The issue involved in the budget requests for this agency, were questions of cost effectiveness on the part of the Legislative Analyst, and questions of further expansion raised by the legislature in light of an uncertain understanding of the responsibilities of this relatively new state agency. This was only the third budget submitted by this agency, and the first compiled under the direction of its first permanent director.

CPEC's requested increases in the Governor's budget were in the area of information systems where further increases were sought for a statewide comparative information system that is not yet fully functional. This system will

collect and compare invormation from all segments of post-secondary education in California and provide the cost comparisons and basic data on the functioning of higher education in California that is currently unavailable from any one source, and currently not comparable because of differences in the interpretation of the information among the segments. CPEC had succeeded in convincing the Governor's Office and Department of Finance of the justification for this request and the Legislature in effect came to convince itself of the usefulness of this appropriation.

During the course of all the public hearings the legislature was constantly looking for information that would yield some perspective on the usefulness of the higher education budget allocation they were asked to fund. The issue, and conflicting data distributed at different times by the University of California in discussion of enrollment levels was a good example of this need for, and frustration with, available information sources. CPEC remained in the background of this search for information. Although CPEC was sometimes cited as sources of data presented by some other group, this agency did not have a great amount of impact in the budgetary process. All of the segments, and many of the student and employee groups were more active in presenting their position on budgetary allocations before the legislature. The Report of the Legislative Analyst and other

studies undertaken by the Department of Finance were sometimes seen as rebuttal information to counter the information given as testimony by segmental representatives. It was apparent throughout this process that some other source of information, which would both assess and describe the status of various programs and practices within higher education in California, would be helpful. CPEC as set up under the federal legislation, would produce some of this information. As a new agency, with a new and expanded mission beyond the scope of its predecessor agency, CPEC has been slow in getting started. UC and CSUC are also protective of their intitutional perrogatives and reluctant to share evaluative responsibility with CPEC.

The process itself argued in favor of the CPEC request, in the end. The Ways and Means subcommittee considered this request near the end of its decision making hearings. Nearly all of the segmental representatives and organized group representatives had gone home by the time this request was considered after 8 P.M. on an exceedingly long day of hearings. The chairman of the subcommittee proposed adoption of the Governor's budget recommendations in full, allowing CPEC the full expansion requested. There was no disagreement. One legislator commented to the CPEC representatives that it was obvious that the state was requiring more and more information concerning the status of higher education within

the state, and that made arguments against increasing appropriations for information systems at CPEC superfluous. CPEC will also be increasing the co-ordination and reliability of some of the data needed for effective decision making in the budgetary process. Even some small relief from the confusion and conflicting data presented in the course of budgetary hearings would be considered a benefit by the legislature.

Observations and Conclusions

It is easy to become caught up in the emotion and controversy that the annual hearings on the state budget provoke. Legislators and high university officials are almost by necessity good public speakers; masters of presenting opinions in most favorable fashion to whatever cause they happen to represent. The subsequent controversy generated is good for all parties concerned in one way or another regardless of the disposition of specific issues. There are, however, some larger questions within this temporal budget process, and those questions are often overlooked.

The major issue under discussion during this past spring in California of concern to higher education has been the question of what level of state support shall go to the students and institutions that collectively make up postsecondary education in this state. This is not a new

question, rather an annual one, that reflects the demonstrated concern of the citizens of this state to develop and maintain a system of support to higher education that has resulted in the creation of a very large, complex, and by most measures, excellent system. Higher education expenditures make up 16.7% of the state's general revenue, and given the total number of dollars in that percentage of state appropriations ($1,400,000,000 billion) that makes these deliberations some of the largest in scope happening in the country. (Chronicle of Higher Education 5/31/75).

The public hearings held in conjunction with the annual legislative review of budget appropriations are one of the few opportunities for direct input and debate to occur in the entire process of the adoption of the budget for the complex of state supported institutions of higher education. At no other time in the budgetary process are the appropriations subject to such public scrutiny. The design and general scope of the budget is carried out by the statewide offices of the segments, and further modified by the Governor's office and Department of Finance. Once passed the budget is returned to the statewide offices of the segment for implementation, with final policy decisions made by the Boards of Regents and Trustees. Little public input happens during either of these processes. So, for better or for worse, the legislative review is a time of critical public review, of state higher-education appropriations.

Halstead (1974) supports this position in his study of statewide planning in higher education. "The traditional means by which colleges and universities satisfy public curiosity concerning their financial operations is through the budget process." Thus, even though policy is not often decided as a result of the budget hearing process, and middle ground compromise is the likely agreement when it is, these hearings are still a necessary and critical part of the governance of higher education in this state.

One does not reach this conclusion as a result of witnessing the hearings. For within the hearing process itself the prevailing impression is of one long adversarial proceeding, with the legislature on one side, and the representatives of higher education on the other.

Robert McNeil, director of the Postsecondary Education Commission alluded to similar feelings in opening remarks to the Ways and Means subcommittee as they began consideration of the higher education portions of the budget. He perceived the enrollment level issue as an expression of dissatisfaction with how the University of California appropriated its funds, and alluded to the difficulties of co-ordination by asking rhetorically who would decide matters of disagreement between the segments.

These are matters that have not arisen in the nearly three decades long expansion of the system of higher education

in California, but are now being asked as that period of expansion slows. CPEC itself is a part of the response to a greater need to govern scarce and necessary resources. The state government, both executive and legislative branches, are playing an increasing role in the creation of higher education policy, and this is not happening with ease among colleagues, rather more with difficulty among adversaries.

I do not believe this to be in the best interests of higher education. At the same time I recognize the need for professional and non-political administration of this state's exceedingly large and complex system of higher education. I do not think that it is necessary, however, for that administration to become the adversary of the public body that funds the public trust that it administers. I think that a greater level of co-operation between the segments of higher education and the legislative and executive branches of the state government would be of greater benefit to the whole higher education enterprise.

Berdahl (1971) in his analysis of statewide co-ordination of higher education classifies California as a "light" state in terms of co-ordination required and actual governmental responsibilities that the higher educational segments have to respond to. Though recently strengthened, CPEC is still basically a data collection agency, with questions of actual co-ordination and policy formulation yet to be worked out

by subsequent experience. The statewide offices of UC and CSUC basically create and carry out the policy of higher education in California. Their major responsibility is to the Governor's office, which both appoints trustees, and must finally authorize their budgets. The legislature plays an important, but secondary role as a reviewing body, but even as it is secondary in terms of actual power, it is, I believe, the key role in terms of public confidence, and public view of the policies and practice of higher education within the state.

Between them state and federal governments fund up to 59% of the expenditures for higher education in the country (Honey 1975). In California the percentage is probably higher, given generous student aid programs, and application of those programs to independent higher education along with public higher education. Yet, even with this level of support, there is a reluctance to share information and confidence among the officials of the state government and the state's universities. Some of this is necessary, of course. It is entirely proper for the state to independently analyze budgets and programs using separate operations and criteria than those used by the insitutions themselves. It is also proper for the administration of the various segments of higher education to expect the opportunity to carry out their administrative responsibilities without being subjected to

second guessing by the non-professional legislature and executive branches of government. But, given those expectations and proper exercises of authority, is it too much to ask for a sense of co-operation among the various parties engaged in this public enterprise?

Public hearings and the budgetary processes are to some degree viewed as a necessary, if not significant exercise by the statewide administrators of higher education. Frustration at the pace and general level of understanding of legislators is a commonly expressed sentiment among those called and volunteering to testify in support of budgetary appropriations. But the hearings must take place, and except for this brief period of scrutiny by the legislature, the state universities are on their own, with only system-wide controls, on their actions. I am sure that professional staff and faculty view the public hearings as just one more necessary, and complicated chore, in their already complex responsibilities, but, I would argue that it is absolutely essential to the continued maintenance of public trust in California's system of higher education. Once the budgetary hearings are completed the universities are once again on their own, with no greater responsibilities until the next budgetary process. I suggest that these public hearings may be more significant than they appear on the surface, for these hearings are vital to a sense of public scrutiny and public confidence in the

governance of higher education. Such confidence is necessary for the continued support of the extensive system of higher education in California, in what is projected to be a time of greater scarcity of educational resources in the future, (More Than Survival 1975).

With the matter of constitutional autonomy subject to additional question and interpretation, and an increasing willingness on the part of the legislature to question matters of public policy with respect to higher education, it is important that educators in this state see interaction with the legislature as a co-operative process, and not just an adversarial one.

With respect to the politics of higher education I am reminded of the considerations of Daniel Moynihan (1975) writing in Daedalus on such matters and quoting Steven Bailey, Vice president of the American Council on Education; "the simple fact is that educators have not been adequately helpful to those who are trying to be helpful to them." I think that observation could pass for an adequate description of educators in California as well.

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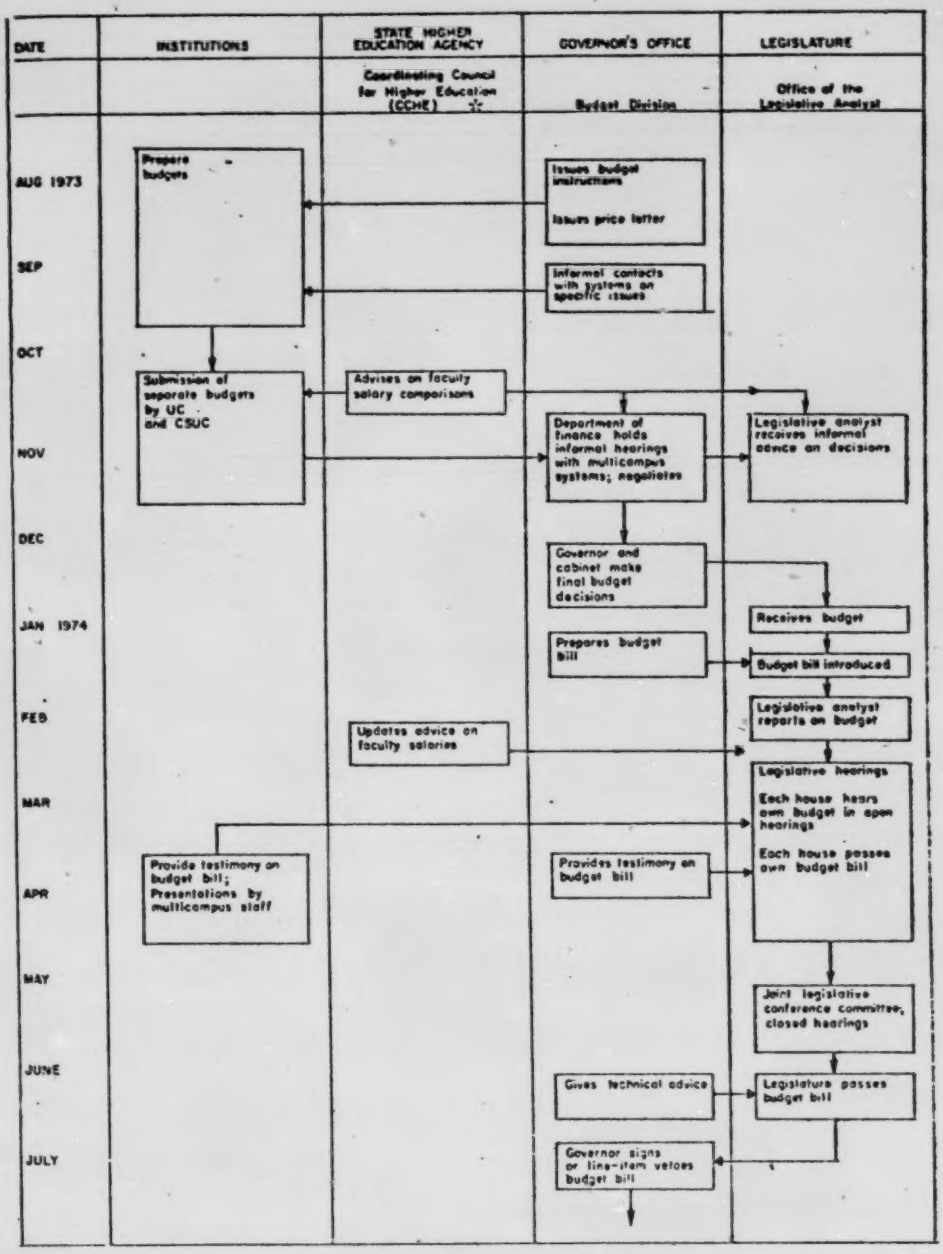
Appendix 1
California Higher Education
Budget Flow Chart (1974-75 Budget)

From: State Budgeting for Higher Education: Data Digest by Glenny, L., Bowen, F., et al

CALIFORNIA HIGHER EDUCATION OPERATING BUDGET FLOW CHART (1974-75 BUDGET)



* This Agency is now
California Postsecondary Education Commission

UNIVERSITY OF CALIFORNIA SYSTEMWIDE ADMINISTRATION

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Appendix 2
Testimony of David Saxon, President,
The University of California
before the Education Subcommittee
of the Assembly Ways and Means Committee
California Legislature 1976 Session
Concerning: The Governor's 1976-77 Budget
for the University of California

The Honorable John Vasconcellos
Member of the Assembly
State Capitol
Sacramento, California 95814

Dear John:

The attached provides answers to the sixteen questions you posed in your letter of January 29, 1976, on the Governor's proposed 1976-77 budget for the University. If you have further questions, please do not hesitate to call me or Vice President McCorkle. In addition, our staff has been in touch with the Committee staff to ensure that the information we both need to make the hearings most beneficial to the legislative process will be available. The information on the attachments is in the same sequence as the questions in your letter.

Sincerely,

David

David S. Saxon
President

Attachments

cc: Vice President McCorkle

Response to Questions* by Assemblyman John Vasconcellos, Chairman, Ways and Means Subcommittee on Education

1. Why don't you agree with the Governor's proposal that the $25.2 million contained in his budget for UC salary increases be allocated on a $65/person basis?

It is our understanding that the Governor and the Director of Finance both view this proposal as a temporary kind of salary adjustment. Even so, as a public institution, the University's policy is to set salaries on the basis of prevailing rates of pay within appropriate labor markets. The principle involved in the proposed $65 across-the-board increase would distort the appropriate relationships in our salary structures. It would collapse ranges and weaken the integrity of the current salary setting methodology for all classes of employees. Comparability is the basic principle utilized by the University for establishing salary levels and for accommodating differences in skills and abilities required for different jobs. It ensures that those who do the same kinds of work receive generally the same level of pay.

For example, academic salary increase proposals are based on comparison studies of faculty salaries of other universities comparable in quality and mission to the University of California and which compete with the University for faculty. The methodology for those studies has been approved and accepted by the California Postsecondary Education Commission (CPEC).

Finally, we believe that in a society in which people are free to make choices about their work, higher levels of pay for more demanding tasks provide a reasonable basis for these choices and that a system based on such incentives is entirely sound.

2. How will proposed appropriations for faculty promotions affect the ratio of tenured/non-tenured faculty members? How is it determined which faculty members receive promotions and merit salary increases?

It is not anticipated that proposed appropriations for faculty promotions will change the tenured to non-tenured faculty ratios in any significant way during 1976-77. For example, promotions to the rank of Associate Professor move the tenure/non-tenure ratio upwards but this effect is at least partially offset by additional non-tenure appointments and by the resignation, retirement, and death of tenured faculty members. Approximately 64% of the general campus faculty is tenured currently.

*In Chairman Vasconcellos' letter dated January 29, 1976, to David S. Saxon, President, University of California, copy enclosed as Attachment III.

Faculty promotions and merit increases are based on the following criteria: (1) excellence of teaching, (2) achievement in research and creative work (contributions to the body of knowledge), (3) professional competence and activity, and (4) University and public service. The University has a long-standing policy that faculty promotions be based on rigorous peer evaluation. Merit increases and promotions are not automatic. They are awarded only after it has been established that the individual involved will make significant contributions on a continuing basis.

3. If increases for the instruction program are included in the budget bill, which is of the greatest priority: additional faculty, additional teaching assistants, more instructional equipment, or additional instructional support?

We have requested, in letters to the Department of Finance, an augmentation to fund enrollments not covered by the proposed Governor's Budget. Funds will be required in 1976-77 on a temporary basis and therefore will be used for non-ladder rank positions rather than for permanent faculty. In general, however, I do not think instructional resources can be considered in a priority order because the interrelationships among the various components of the instruction program make it almost meaningless to separate one part of the request from another. For example, the amount of instructional support and equipment necessary, as well as the required number of teaching assistants, are largely dependent upon the size of the faculty. (The importance of instructional equipment is dealt with in detail in answer to question 5.) Faculty cannot function most effectively and efficiently without adequate support, equipment, and teaching assistants. Ranking priorities among these items places an artificial value upon each of them because it does not recognize their interdependence.

4. What specifically would the additional $3.9 million in instructional support monies buy? Are instructional support dollars allocated to all academic departments on an equitable basis?

We currently estimate that of the additional $3.9 million for instructional support, $1.5 million will be used for instructional use of computers and $2.4 million will be used for replacement of obsolete and inadequate University-owned instructional equipment.

The instructional use of computer funds will be used to increase State support from $12 per student in 1975-76 to about $23 per student in 1976-77. Independent internal and external studies have indicated a minimum requirement of $65 per student to provide students sufficient exposure to computers and to enable advanced students to acquire the sophisticated capability with computers needed in today's society. This would require $7.6 million in 1976-77, an increase of $6.2 million, but the University has asked for only a fraction of that amount this year.

With respect to instructional equipment needs, the University recently completed a careful, detailed study of its $160.8 million instructional equipment inventory. Our conclusion based on this study, is that approximately $8.7 million is required annually for equipment replacement; we currently spend $4.0 million for both new and replacement equipment.

While it is obvious the $3.9 million provided will not cover all of the needs in the two areas, the funds will enable the University to begin to resolve some of its most pressing needs. The University attempts to allocate funds to academic departments equitably by recognizing program mix, students by level, and substantive academic plans. Specific allocations to given departments are made by the Chancellor or his designee (e.g. Dean) to ensure that programmatic requirements are met and to permit optimal consideration of priorities.

The need for a permanent source for instructional equipment replacement represents a high University priority. In past years, the capital budget included instructional equipment monies as part of the capacity space projects required as the University's enrollments grew. While the need for capacity space projects is not as pressing as in the past, the need to replace obsolete instructional equipment is even greater. The instructional equipment money included in this item indicates the Governor's willingness to confront this need.

5. What type of instructional equipment, and for what programs would be bought from the proposed $5 million COFPHE appropriation?

The University proposes to use $2.4 million of the COFPHE appropriation in 1976-77 to meet a portion of the equipment needs of the various instructional departments. Data developed by the University to identify its equipment replacement requirements indicate 52 classes of equipment used in instructional departments. The instructional equipment already obsolete or becoming obsolete during the current fiscal year can be distributed to the following classes:

Measuring, Controlling, Laboratory, Optical, and Related Instruments	52%
Communication and Electronic Equipment	13%
Medical, Photographic and Laboratory Equipment	15%
Remaining Classes of Equipment	20%

Although the type of equipment becoming obsolete indicate that the need in the sciences and engineering programs is particularly severe, meetings with Deans, department chairmen and equipment users, and questionnaires received from selected departments on all campuses revealed that the problem of instructional equipment replacement is currently being felt by almost <u>all</u> departments.

6. What would the precise impact on average class sizes (be?) if The Regents' request or the Governor's proposed increases in instructional staff were not approved?

The simple answer to this question is, unfortunately, the most misleading answer. The simple answer is that the overall average class size, using any of four or five equally valid definitions, would most likely increase insignificantly if the 18 faculty FTE and 3 TA FTE were removed from the Governor's Budget. But the statistical solution to a problem involving hundreds of faculty and thousands of students in a wide variety of class settings obscures the nature of the instructional process at the University.

There are instances in which the introduction of one new faculty member will increase the average class size in the department in which he/she is teaching because the new areas of inquiry added to the department's curriculum will attract many more than the average number of students. There are instances in which the addition of one new faculty member will provide a department the opportunity to offer three new seminars. Under these circumstances, the average class size for the department might increase, decrease, or stay the same. But the enrichment of the curriculum through the offering of new courses, and the enrichment of the student's instructional experience through the opportunity to participate in special seminars cannot be measured by class size statistics.

The current literature in Psychology and Education on the subject of class size is conflicting, but some things are clear. There is a change in the intergroup dynamics of a class when the number of participants exceeds 13 or so. There are instances in which a class of 200 is educationally as productive as 5 classes of 40. There are many instances in which it is virtually impossible to provide a quality instructional experience (the teaching of poetry or beginning Russian for example) unless there are fewer than 30 students in a class. The need for additional faculty is basically, of course, to increase the opportunity for students to benefit from this range of instructional settings, not to lower a statistical average by a percentage point or two.

7. How will Extended University students be supported if no State support is forthcoming? What would be the cost of a State supported fee waiver program for low income Extended University students?

In separate correspondence I am requesting your subcommittee, the Legislature and the Governor to provide resources to support the students we now have in the Extended University "pipeline". If no State support is forthcoming the University will make every attempt to allow them to complete their programs. This means that students currently enrolled in Extended University programs will have to be supported from non-State funds (as far as possible), while the program is being phased out. The University is committed to allowing these students to complete their programs.

The eight campuses with Extended University programs have been informed they may retain those programs they can support from existing resources beyond the phase-out period. The campuses are in the process of determining which programs they will attempt to maintain, and we cannot, at this time, anticipate which ones these will be.

The fees paid by Extended University students, as with all regular students, are not used to support the cost of instruction except in 1975-76 when State general funds were not available for the Extended University. Extended University student fees are used to pay for student services and some administrative costs of the program. A fee waiver program for low income Extended University students would not provide funds for the delivery of instruction.

The cost of a fee waiver program for Extended University students reporting annual incomes under $10,000 in 1974-75 would be as follows, based on data from Berkeley's Survey Research Center:

Student Income Range	Number of Students	Fees Charged* EXU Students	Cost of Fee Waiver for One Quarter	Cost of Fee Waiver for Three Quarters
Under $5,000	119	$105*	$12,495	$ 37,485
$5,000-$7,999	87	$105	$ 9,135	$ 27,405
$8,000-$9,999	141	$105	$14,805	$ 44,415.
	347		$36,435	$109,305

8. How are funds appropriated for the Teaching Excellence program allocated to projects? How are they evaluated in terms of the long-run impact on the instructional program? What is the average project grant?

From the State's 1975-76 $999,999 for teaching excellence, $4,999 was set aside for systemwide coordination and dissemination, $15,000 core support was allocated to each general campus, and the remaining funds were apportioned among the general campuses on the basis of budgeted undergraduate FTE enrollment. In allocating these funds, the Systemwide Administration provided the campuses with guidelines for their use, and requested three planning and evaluation documents: an expenditure plan for 1975-76, a longer-range plan for instructional improvement over the next several years, and a self-assessment of the 1975-76 program and its educational impact on the campus.

*Extended University students are charged 50% of the fees paid by regular, full-time students--$100 per quarter for undergraduates and $110 per quarter for graduate students. The $105 figure used above is an average.

The first of these planning documents is now in from each campus with a strong indication that the campuses are gaining sufficient experience with this kind of funding to be able to identify campus needs, formulate priorities, and plan systematically for a coordinated instructional improvement program. On most campuses selection of projects to be funded is made by the academic vice chancellor on the recommendation of an advisory committee of students and faculty who review all proposals submitted. Determination is made as to whether campus instructional improvement needs are best met by concentrating a large sum of funds on a single project like establishment of the Teaching Resources Center at Davis, by providing seed money to a number of small projects which hold promise of becoming part of the regular instructional program, by encouraging a few small high risk experiments, or a combination of projects from several of the categories above. Projects funded this year range from minigrants as low as $100 to some grants of tens of thousands of dollar. Average size of grants varied considerably with Santa Cruz's average grant of $10,350 roughly half the size of Berkeley's.

The President's Advisory Committee on Instructional Improvement Programs is reviewing the 1975-76 campus plans and will report its evaluation to the campuses and the Systemwide Administration. This evaluation will be provided in time to affect the longer-range instructional improvement planning process and the campus self-assessment of its 1975-76 program. In 1976-77 The Regents' Instructional Improvement Program will be consolidated and added to the State's Teaching Excellence Program, providing each general campus with a single sum of considerable size to be administered under a single set of guidelines to promote instructional improvement and teaching excellence. This prospect has provided the incentive for the campuses to seriously consider and critically explore how and what should be done to achieve long-term improvement of the instructional program.

9. What percent of the proposed increase of $3.3 million for health science instruction would be allocated for primary care/family practice programs?

Within the full scope of medical school programs, identification of funds with specialty areas is appropriate only at the internship and residency level, as that is the first level at which there is a clear continuing commitment by the students to a field of practice. Thus, of the $3.3 million increase for health science instruction, only that $1,737,000 portion which is attributable to additional interns and residents is identified here. Of the $1,737,000 increase for instruction of interns and residents, $1,316,000 is attributable to additional interns and residents in primary care specialties (including family practice, general internal medicine, general pediatrics, obstetrics, and gynecology). The remaining $731,000 is attributed to additional interns and residents in specialties other than primary care (medical specialties, surgery and surgical specialties, psychiatry, pathology, and

radiology). This $731,000 includes $310,000 of full-year funding of interns and residents in non-primary care specialties at OCMC. The $1,563,000 balance of the $3.3 million increase will be allocated for instruction in medical school programs for students other than interns and residents and for instruction for all categories of students added in the schools of dentistry, nursing, optometry, public health, and pharmacy.

In dentistry, most D.D.S. candidates will be engaging in primary care on graduation. Professional degree (O.D.) candidates in optometry can all be assumed to be entering primary care fields. The designation of primary care/family practice is not meaningful for students in schools of nursing, public health, and pharmacy.

10. Could the $2.5 million proposed for purchase of the Orange County Medical Center be better utilized for the support of community clinics?

No. Although the contract between The Regents and the County of Orange is quite equitable in the view of the University, one area in which the County would not yield during the contract negotiations was with regard to title to the OCMC property in the event that the contract is terminated by either party, after being in force for at least ten years. Under the terms of the contract as executed, the County would regain title to the land and the buildings, including any improvements made by the University, unless the University has paid for the land on which the medical center sits. To protect the investment that the University will necessarily be making in OCMC it is therefore essential that the University pay for the land prior to any termination of the contract. While the contract provides to the University the option of purchase of the land at any time the contract is in force, purchase after December 21, 1976, would be at the then fair market value, and purchase before that date would be at the guaranteed price of $2.5 million, a price which is below the value placed even now on the land if its use were not restricted to operation of a medical center.

In addition, we believe it is fiscally prudent for the University to lease community clinics because the costs of the lease can be included in the charges for services at the clinic. It will also give the University the flexibility to relocate any clinics which are not being adequately utilized.

11. How have the funds from Assembly Bill 2412 (Meade) been expended? How will the proposed additional $275,000 for EOP be spent?

In September, 1975, the Governor signed AB 2412 (Meade) which provides $1.1 million to be used for outreach and support programs designed to increase the enrollment and retention of disadvantaged students. The legislation requires that the University provide an equal dollar amount from its internal resources to match the State appropriation.

As indicated in legislative testimony and in written material distributed to legislators and representatives from the Department of Finance and the Legislative Analyst, the University has agreed to supply the necessary match from Educational Fee reserve funds. The University appropriation will be used for additional outreach efforts; the State appropriation will be used for financial aid to students brought into the University as a result of those outreach programs.

The University's plans in the Student Affirmative Action area are built around the recommendations of five student-faculty-staff Task Groups on Student Affirmative Action appointed by President Hitch in Fall, 1974. These Task Groups were asked to review particular aspects of the educational process and to identify any barriers to the access or success of women, members of minority groups, and economically or otherwise disadvantaged students. Once those barriers were identified, the Task Groups were to set forth recommendations on their elimination.

Outreach

Information available to the Student Affirmative Action Task Groups suggests that the proportion of minority students eligible to attend the University who actually attend the University appears to be lower than the comparable proportion of non-minority students attaining eligibility.

A total of $1.1 million is being spent to augment University outreach programs during 1975-76 and 1976-77. This expanded effort will have a dual focus.

First, to increase the number of qualified minority and/or low-income students enrolling in the University, each general campus received $35,000 to expand its high school and community college outreach efforts (San Francisco received $12,000). Typically, these funds are being spent to add minority recruiters, develop minority-oriented brochures and films, and increase the use of University students as tutors and para-professional counselors. A similar amount will be allocated to each campus next year, for a total expenditure of $584,000 during 1975-76 and 1976-77.

Second, to increase the number of low-income and/or minority students attaining University eligibility, a new Partnership Program has been developed and will soon be fully underway. This program, which will be operated regionally, focuses on increasing the academic achievements of disadvantaged junior high school students. A total of $516,000 will be spent on this program.

Financial Aid

$1.1 million has been set aside for use in meeting the financial needs of students brought into the University as a result of the expanded outreach efforts described above. At this point, it is not entirely clear how many additional affirmative action students will enroll during 1976-77. Also the present uncertainty about

the level of Federal support for the Basic Educational Opportunity Grant makes calculation of likely per-student awards rather awkward. In view of these factors, detailed budgeting is impossible.

However, based upon last year's applicant patterns and this year's increased outreach activity, it would appear likely that this year's entering class will contain 660 more new minority students than the previous class. If this trend hold, the $1.1 million will be spent approximately as follows:

(1)	660 students @ $1,500*	$1,000,000 (approx)
(2)	Early commitment, needs analysis, and financial counseling	$ 100,000
	TOTAL	$1,100,000

$275,000 Augmentation in Governor's Budget

The 1976-77 Governor's Budget proposes an augmentation of $275,000 in State support, contingent upon an equal contribution from the University. This additional funding is essential to the Student Affirmative Action program, for, while funds have been made available to increase outreach activity and to augment financial aid resources, no funds have been appropriated to cover the cost of support services for these students once they enter the University.

We are particularly concerned that all students recruited and admitted under special programs have a reasonably good chance of achieving their educational and career goals at the University. Despite the fact that most of these students come to us as regular admissible students, experience tells us their chances of reaching these ends are dependent on the institution's commitment to addressing their needs--personal, psychological, financial, and social. While the interactions of these needs are complex, we are sure that skills deficiencies in mathematics and English composition are central. In addition, many of the students arrive without a clear understanding of the variety of options available to them at a University. We therefore plan to use these additional monies, if approved, to increase student support services along the following lines:

(1) Increased tutoring and academic advising;

(2) expanded counseling--emphasis: interrelationships of undergraduate education and careers;

(3) pre-registration counseling and advisement;

(4) special summer preparatory institutes aimed at increasing specific skills in minority students interested in certain disciplines (e.g., pre-science majors and health science-directed students).

*This rate is based upon a predicated cut-back in BEOG. Should this development not occur, the per-student coverage could be lower.

In addition, we would reserve approximately $50,000 of these funds for a careful evaluation of the impact of these programs on student success. Because of limited funds, we have in the past been unable to devote enough attention to program evaluation. By using an experimental program approach on the campuses and carefully evaluating results, we believe that we will be better able to identify the best means of addressing skills deficiencies in affirmative action students.

12. Do you agree with the Governor's Budget estimate (page 1015) that $2.7 million in Basic Educational Opportunity Grants are being received by UC students this year?

The $2.7 million figure was provided to the Department of Finance by the University last fall when the Governor's Budget was being put together. It was a preliminary estimate and we now believe that we will receive more than that. Our present estimates are that in the aggregate, Basic Educational Opportunity Grants to the University of California students for 1975-76 may come close to $6 million and will not be less than $5 million, depending on whether Congress passes a supplemental appropriation to cover a shortfall of $180 million for the current year.

13. What are the specific results of the $60.5 million expenditures for research?

The University's organized research program supported by these funds is broad and diverse. It is closely related to both teaching and extramurally funded public service research. Because a responsive answer to your question is necessarily lengthy, it is appended as Attachment II.

14. What is the total level of University support for the Community Teaching Fellowship Program? What is the impact of the program?

The Community Teaching Fellowship Program (CTFP) is a University-wide educational service program which provides mathematics enrichment to 900 children in twelve elementary schools in minority and poverty neighborhoods. Instructors are graduate students in the mathematical sciences who are paid at the same rate as a Teaching Assistant. The Regents' budget for 1975 allocates $176,000 in non-state funds for this program.

Program effectiveness has been demonstrated in the schools by the children's improved standardized arithmetic test scores and positive attitudes toward learning mathematics. Parents, teachers, and school administrators view the program as extremely beneficial. Additional educational service activities have included workshops for teachers, developing record transfer systems for children of migrant farmworkers, and teaching mathematics to youngsters released from Juvenile Hall.

In addition to educational service and graduate student support, CTFP has directly contributed to the improvement of some of the University's primary functions, such as undergraduate instruction, teaching training, and research in mathematics education. Faculty members from the Department of Mathematics at each of the eight general campuses are active in the program as advisors, supervisors, and in many cases as teachers. This direct, daily contact with mathematics education in the elementary schools has led to the restructuring of pre-calculus courses, mathematics courses for teachers, and other mathematics courses for non-majors. Several papers by Community Teaching Fellows and CTFP Faculty Advisors based on their experiences in this program have been accepted for publication by mathematics education journals with national and international distribution.

The effects of the CTFP are visible in all mathematics departments, but at some campuses the impact has been even more than one might expect. For example, Davis has developed a whole new graduate degree program around CTFP, the Master of Arts in Teaching, while Riverside has taken an unpopular and under-enrolled mathematics course and turned it into the highest rated (student evaluation) course at the campus.

15. What is the average annual income of UC faculty members from independent consulting?

The University does not have information on the income faculty members may receive from independent consulting. To request such information might well be construed as an invasion of privacy.

The University is, of course, concerned that faculty members not neglect their duties to the University. The Standing Orders of The Regents (103.1) state that "No one in the service of the University shall devote to private purposes any portion of the time due by him to the University, nor shall any outside employment interfere with the performance of his University duties."

The President has been delegated authority by The Regents to issue regulations concerning private employment. University Regulation No. 4, a time-tested policy which has withstood the rigors of a demanding environment, a statement of principles underlying it, The Faculty Code and University presidential statements on conduct, together with various University regulations governing compensation are all safeguards against possible abuse. It should be recognized that professional activities provide for creative activity through field experience. Especially for faculty in our professional schools and colleges, an appropriate amount of outside activity can greatly enrich their teaching and research. In addition, these same contacts are advantageous to the institution in providing jobs for students, and enabling the University to attract and retain highly qualified members of the faculty in fields such as law, medicine, and engineering.

16. What percentage of the instructional budget is expended for undergraduate interdisciplinary teaching programs such as Social Ecology at UCI, Energy and Resources, and Strawberry Creek College, both at UCB?

Interdisciplinary programs at the University exist or are proposed in the campus Academic Plans at all levels of instruction and encompass the physical, natural, social, and health sciences. Examples of current programs, in addition to those already cited, are Frontiers of Science (San Diego), Ethnic Arts (Los Angeles), Environmental Studies (Santa Barbara, Santa Cruz), Religion and Religious Studies (Davis, Los Angeles, Santa Barbara, Santa Cruz), Communications (Davis, San Diego), and Community Studies (Santa Cruz). While interdisciplinary programs have existed in the University in one form or another for many years, the number has increased recently because of new technologies which cross boundaries of established fields, because of student demand for more breadth and innovation in their educational experience, and because of a desire by departments to consolidate and modify existing programs.

The funds allocated by the campuses to undergraduate interdisciplinary programs are contained within the University's Instruction and Research (I & R) budget. Since each campus' approach to the structure of these interdisciplinary programs is somewhat different, and since prorating the resources associated with them is quite difficult, a calculation of the percentage of I&R resources devoted to the more than sixty undergraduate interdisciplinary programs on the University's campuses would require a very time-consuming review of each individual program.

13. What are the specific results of the proposed $60.5 million expenditures for research?

The University's state-funded research budget is in the following major categories:

General Campuses	18%
Health Sciences	2%
Agricultural Sciences	46%
Marine Sciences	6%
Faculty Grants and Travel	5%
Employee Benefits	8%
Subtotal	85%
Restricted Funds	15%
Total	100%

As is evident above, about half of the proposed expenditures* for organized research is allocated for the State's long-term commitment to research in the agricultural sciences.

State support for organized research has declined by almost $10 million (about 19%) in terms of actual purchasing power over the past nine years. This decline in "real" State support is making it increasingly difficult to maintain the wide range of high quality research programs necessary to produce the knowledge essential for the education and welfare of future generations of Californians, and it is making it even more difficult to open up those new areas of scientific and scholarly inquiry.

State funds for research serve a number of purposes: (1) support research programs mandated by the State, (2) provide core support for Organized Research Units and activities, (3) support specific instructional programs, and (4) provide for faculty development. While there are conceptual distinctions between these purposes, they in fact overlap, and particular funds serve more than one purpose.

A most important function of these funds is to provide the "working capital" or the "lodestone" which enables the University to multiply its research capability by attraction of funds and personnel; they add the flexibility which allows the University to mount interdisciplinary and mission-oriented programs of research. Organized Research Units then mobilize faculty through the provision of facilities and central management of grant and contract proposals, and constitute an essential complement to the disciplinary research performed and administered by departments. In addition, Organized

*Excluding the 15% of the total which is from "Restricted Fund" (non-state) sources and which cannot be used for purposes other than those specified by the donors.

Research Units have greatly enhanced the University's ability to develop strong educational programs and even entire campuses. For example, Scripps Institution of Oceanography played an indispensable part in the creation of the San Diego campus, not only in the special program area in Oceanography and related marine sciences, but in many other areas.

Organized Research Units are established and developed in balance with the departments and colleges throughout the University to ensure their compatibility with the programs of academic units with which they might otherwise compete for resources. Because of their interdisciplinary nature, Organized Research Units are essential complements to the research and instructional programs of departments, enabling the organization of academic enquiry around broad subject areas and thereby helping to make teaching programs, both undergraduate and graduate, more responsive to the changing complexions of disciplinary and interdisciplinary study.

Many Organized Research Units participate directly in undergraduate curricular enrichment. For example, during 1973-74 the Center for Pathobiology at the Irvine campus provided opportunity for 30 undergraduates to work on various research projects in the areas of developmental biology, pathobiology, cell biology, entomology, and genetics. It has enriched the academic program of undergraduates by attracting distinguished visiting scholars and by bringing the students into contact with researchers and postdoctoral students through tutorials, laboratory research, apprenticeships, and freshman seminars.

Upper division work is enhanced considerably by, and graduate work is closely tied to, organized research programs and activities, which ensure that facilities are available and that specialty teaching by research faculty is of high quality. Many types of direct student involvement can be found, all are essential to educational excellence. For example, there has been an 85% increase in student use of the Lick Observatory as an Organized Research Unit since 1970-71.

Although the tie to teaching is important, organized research activity is also important for its long-range implications. The years ahead will be characterized by changes even more startling and potentially dislocating than those Californians have experienced in the past decade. Much new knowledge will be needed to deal effectively with these changes. As the State's primary academic agency for research, it is the University's responsibility to create and transmit the new knowledge needed to help future generations of Californians, society at large, and all mankind cope with the inevitable problems of an unknown future. Because it is impossible to predict exactly what knowledge will be useful in the future, the University must push forward the frontiers of knowledge as widely as possible, thus, increasing the probablity of having at hand knowledge which, ultimately, will help our children ameliorate societal problems which now are beyond our meager ability to foresee.

In one important area the University recently has taken a number of initiatives to report the "specific results" of policy relevant research to California public officials and agencies of government. The Program to Improve the Dissemination of Research Results, established last year without State General Fund support, enabled faculty and other University researchers to undertake special projects to transmit to State Government officials, legislators, and staff the findings of nineteen separate research projects carried out on all nine campuses of the University.

The nineteen projects covered substantive policy areas in environment and energy, health, education, welfare, corrections and governmental organization. A majority of these projects disseminated the results of on-going research, thereby bringing scientific information directly to the attention of State public policy makers much earlier than it would normally be available through conventional scientific and professional literature.

In addition to these projects, the results of an anticipated twenty-six other policy relevant research efforts will be brought to State public policy makers between now and July through personal briefings, workshops and policy papers. These projects will cover current public issues such as resource recovery from municipal solid waste, land use, the California Environmental Quality Act, assessing the quality of medical care, computer fraud and bi-cultural education. While these forty-five research projects (about half of which were completed in organized research units) represent only a very small percentage of the total number of policy relevant investigations being carried out by faculty, they were selected for concentrated emphasis because of their special relevance to existing state issues.

State funds permit the University to maintain a basic on-going research capability which gives California a competitive advantage in seeking support for research projects from the federal government, foundations, and other external funding sources. Without the essential infrastructure maintained with these funds (e.g., technicians, equipment, facilities operation, and administrative structures) the research capacity of the faculty and the University (and thus, the State) would be seriously compromised.

Appendix I contains descriptions of some 31 examples of on-going University of California research.

Appendix

APPENDIX I (ATTACHMENT II)

UNIVERSITY OF CALIFORNIA

RESEARCH

The following thirty-one examples are illustrative of the range of research results produced by the University's research programs.

Public Policy Research Organization (Irvine)

A facility designed to foster the initiation, conduct, and utilization of research on international and domestic problems of public policy. The organization focuses its work on two objectives: (1) research contributing to improved policy-making, nationwide, concerning utilization of modern information technologies, and (2) research leading to improved nationwide capabilities for evaluation of the consequences of public programs and policies.

A study of California's Environmental Quality Act was undertaken to answer two central questions: (1) How well is the CEQA process working? (2) Can it be improved to be more effective and less costly? The evaluation included an analysis of state, regional, and local practices for the preparation and review of environmental documents. (A detailed examination of the environmental impact assessment practices of fifteen (15) California cities and counties was also completed.)

The investigation has found considerable variation in the strategies local governments have adopted to implement the California Environmental Quality Act. All of these strategies comply with CEQA in that public officials receive information describing the likely impact of their decisions on at least the natural environment. It is as yet difficult to determine, however, if local decision makers are weighting the environmental impacts as heavily in their deliberations as CEQA intended. What is clear is that the exercise of implementing the act has changed the mechanisms by which local governments make development decisions.

Urban Information System (URBIS) - The major research project underway at PPRO is an evaluation of urban information systems. Called URBIS for short, this is a three-year project which began in June 1974 and is scheduled for completion in September of 1977. It is supported by a grant from the National Science Foundation, Research Applied to National Needs Division (RANN). Purposes of the project are to discover the level of computer information systems in the nation's larger cities and counties; to discover the ways in which this technology has affected performance, such as decision making, service technology and work environment; and to identify and recommend policies that might improve performance, reduce operating costs and protect information.

Bureau of Educational Research and Development (Santa Barbara)

Focuses its efforts on the solution of pressing educational problems through multidisciplinary inquiry and sophisiticated development. A secondary mission of the Bureau is to provide technical services, administrative assistance, and consultation services for individual investigators whose research interests are in or relevant to education. Present activities of the Bureau include (1) a training program for experienced educational administrators, using the methods of confluent education; (2) evaluation of educational programs in the University and/or in public schools; and (3) assistance to a number of professors who are developing proposals for extramural grants and contracts.

Northern California school administrators and their spouses were selected for training in confluent education, the merging of cognitive and affective modes of teaching. One purpose of the project was to see if a previously developed 3-year training model could be adapted to a one-year time span. Specific project goals were: 1) to enable participants to lead fuller, more satisfying personal and professional lives, 2) to stimulate more humanistic practices and orientations by the professionals participating in the program, and 3) to stimulate innovative structures, policies, and practices for humanizing the professionals. Training was conducted in workshops employing activities selected to be relevant to key ideas central to each goal. Formal tests and personal interviews were employed to evaluate progress by project members.

GUSTAVE E. VON GRUNEBAUM CENTER FOR NEAR EASTERN STUDIES (LOS ANGELES)

To encourage research and training in basic problems related to the Near and Middle East countries of modern and medieval times.

The Center is continuing work on the survey to assess the status of Near Eastern content in the social sciences at the pre-collegiate level. The survey is directed by Professor John Hawkins of the School of Education and the students analyzing the content of textbooks represent several Near Eastern national backgrounds, such as Arab, Palestinian, Israeli, and one American. The survey consists of three projects: a survey/questionnaire whereby the Near Eastern staff conducted an extensive search to locate and evaluate surveys already completed on the status of Near Eastern studies, and subsequently conducted an independent survey; a curriculum evaluation whereby standard instructional materials held by the Curriculum Inquiry Center of the Graduate School of Education were evaluated by the staff utilizing a cross-cultural evaluation instrument; and finally, an extensive search was made of currently available instructional materials for teaching Near Eastern content at the pre-collegiate level. This information is being compiled in a teachers resource handbook for distribution to public and private schools.

Institute of Industrial Relations (Los Angeles)

An interdisciplinary research and publishing program directed primarily toward the study of labor-management relations, economic security programs, the labor market, the impact of technological change, and related studies. A secondary activity consists of community and labor relations programs designed for management, unions, special groups, and the general public.

A study was initiated to formulate an operational approach to the manpower implications of direct wage/price controls. The goal is to provide wage controllers a practical discussion of the interrelationship between three types of manpower problems: (1) manpower allocation distortions created by controls; (2) manpower distortions occurring within the firm; and (3) interrelationship between controls and manpower policies, and a wage control program. The major focus of the study is to develop indicators of the costs of controls. It should provide policymakers with a wide range of possible costs associated with controls--and suggest ways in which these costs might be minimized--without answering the ultimate question of whether controls ought to be used in the first place.

Seismographic Stations (Berkeley)

The University operates 18 seismographic stations in Northern California to study the seismicity in Northern California and parts of Nevada and Oregon. The research programs involve the study of earthquake wave propagation, the nature of the waves, their relation to earth structure, the nature of earthquake sources, strong ground motion, and related subjects. The first stations at Berkeley and Mt. Hamilton were established in 1887, the oldest stations in the Western Hemisphere.

An extensive field study and computer processing development is underway directed toward delineation of underground geothermal reservoirs. The aim of the investigation is a definitive evaluation of the applicability of a range of seismological (and other geophysical) techniques that have been used in larger-scale studies of Earth structure. Data have been gathered in the north-central Nevada region of anomalously high heat flow. Under study are microearthquake occurence and spatial variations in time delays, amplitudes, and spectral variations in waves from distant sources, as well as spatial variations in spectral characteristics of local seismic ground noise (Dr. T. V. McEvilly).

Perhaps the most important seismological work at the Station during the last year was the preparation of a complete catalogue of Central and Northern California earthquakes recorded during the period January 1, 1910 to June 30, 1973. This catalogue summarizes 63 years of devoted work by seismology staff and students on the seismicity of Northern California. The catalogue will be available in both printed and magnetic tape form.

CANCER RESEARCH INSTITUTE (SAN FRANCISCO)

A center for research, education and service in investigation of cancer and related diseases. The Institute supports the General Tumor Registry, the Consultative Tumor Board, the Visible Tumor Clinic, and the Consultative Tumor Board at the San Francisco General Hospital.

Laboratory research projects emphasize the cell biology and membrane biology of cancer and range from the possible oncogenic role of xenotrophic viruses to the immunologic characterization of the malignant cells of Hodgkin's Disease and lymphoma. Clinical studies on the leukemias, carcinoma of the breast, and gastrointestinal cancer are also underway.

Using the Saritorius breast pump technique and intraductal catheterization, samples from a wide variety of women are being obtained in order to develop a routine diagnostic tool for early identification of breast cancer. Electron microscopic examination of these samples is a necessary part of this project. As a co-investigator in this project grant, headed by Dr. N. Petrakis, Dr. Ellen Dirksen is in charge of the screening and identification of mammary tumor viruses (B-type) in aspirated breast secretions, while Dr. Martin Apple correlates these findings with reverse transcriptase activity.

Efforts to enhance the therapeutic ration in radiation therapy are currently being made. The experiments being conducted include a manipulation of three variables which can modify the differential response of normal tissue and tumor to radiation. They are directed at isolating those factors which increase tumor kill but decrease normal tissue damage. The results will be used to design improved clinical uses of alterations in fractionation, dose-rate and the addition of chemical modifying agents.

Two feasibility studies were initiated to investigate the natural history of breast cancer of black women by determining survival with respect to factors such as histology, clinical pathology and demographic characteristics and to study the histological, social economic and survival differences between black and white women with breast cancer. The first phase of this study is near completion with the abstraction of records from three major hospitals in Alameda County as well as the records at UCSF. A preliminary study of the relationship of lipids to breast cancer did not indicate any association.

CENTER FOR THE STUDY OF COMPARATIVE FOLKLORE AND MYTHOLOGY (LOS ANGELES)

A center to stimulate interest in and conduct research related to modern folklore, mythology, primitive myth and ritual, popular beliefs, and superstitions. Through these programs are developed a greater understanding of societies and the impact of higher cultures upon lower.

American Folk Speech. Professor Robert A. Georges and his students have made pilot studies in Folk Speech and are developing a system for archival storage and retrieval by data processing.

Folk speech, perhaps more than any other genre of folklore, reflects the passing vogues of speech and modalities of communication in short-term sequences. Instead of dealing with changes noted over a century or a generation, one can deal with decades or shorter periods of time. In its timeliness and modernity, folk speech demonstrates the currency of folklore, which is often erroneously thought to belong to olden times and unsophisticated peoples. Many genres other than folk speech can be similarly demonstrated in modern, urban cultures. Folk speech, however, is an excellent starting point for data processing, dealing with words and phrases easily handled and also providing insight into twentieth-century values as reflected in surviving folk expressions--staid, colorful, tangy, and pregnant by turns.

Community and Organization Research Institute (Santa Barbara)

Organized to facilitate basic interdisciplinary research on social problems of the community, broadly defined to include international as well as local problems. On the local level, the Institute is involved in the development of training programs, and in faculty, student and community involvement in the generation of information facilitating improved policy decisions. The Institute also serves as an interface between disciplines in sponsoring seminars and symposia on areas of special interest.

Minimizing the social cost of drunken driving is the focus of a Ford Foundation supported interdisciplinary research project to examine a specific problem of social control: the minimization of the social losses from drunken driving. The goals of the research are (1) to examine and catalog the various methods for achieving social control of drunken driving in the United States and several western European countries, (2) to compare and contrast European methods and effectiveness with the American experience, and (3) to indicate the control options available to policy-makers given the degree to which they are constrained by culturally determined attitudes and political realities in the different countries. The study consists of three phases. Phase I is an evaluation of the political process as it affects social control. Phase II involves the formulation of behavioral models appropriate for comparing performance between countries. Phase III consists of an evaluation of the empirical studies to determine their implications for policy. The research team consists of members from the fields of criminology, economics, political science, and sociology. Theory and data from both societal (macro) level and individual (micro) level research will be utilized. Data will be collected in several nations at different socioeconomic and political power levels in order to develop a broad model capable of analyzing the variance among countries and among different sized jurisdictions in the efficacy of their social control techniques.

Operations Research Center (Berkeley)

A research unit concerned with the problems of optimal operation of systems and the development of the theoretical basis for the solution of such problems. Some of the theoretical areas of research are mathematical programming, combinatorics, network flow theory, reliability theory, dynamic programming and optimal control theory, decision theory for stochastic processes, and the theory of production. The applied research programs have in the past been concerned with forest fire control, water resources planning and management, solid waste disposal systems, traffic and transportation systems, models of fuel and energy use in the U.S. economy, manpower planning, financial planning, models of regulatory constraints for California banks, and models for options and hedging of securities.

A large scale detailed model of energy and fuel use in the U.S. national economy has been developed by the center. The core of this model is a 97 sector input/output table updated from the 1967 table published by the census, to the base year 1972. This basic input/output model has been expanded to include: energy flow data in physical units, employment by 40 job classifications, explicit representation of competitive imports, and disaggregation of three major energy industries to include substitution possibilities of fuel production and use. The disaggregated industries are electric utilities, iron and steel, and petroleum refining. The electric utility submodel also includes peak load capacity constraints.

Preliminary development has been completed to include price effects on consumer demands in the analysis. This has been done by optimizing a quadratic (instead of linear) objective function, but, because of computing difficulties inherent in quadratic as compared with linear optimization, only for a simplified model structure.

The purpose of the model is to examine direct impacts of fuel and energy shortages on employment, output of various domestic industries, imports, and prices. The model in its present form will yield a partial equilibrium solution and does not attempt to reflect business cycles nor captial bottlenecks along expansion paths.

Future plans for this model include incorporation of capital formations requiremnts for expansion of domenstic industry capacity, thus making dynamic analysis possible.

Institute of Marine Resources (San Diego)

The broad objective of the Institute is to acquire and disseminate knowledge of the sea's resources, not only the contents and nature of the ocean and its boundaries, but also the social, legal, economic, and political aspects and constraints of its uses. Its programs involve research, education and public service in relation to man's uses of marine resources, including food science, marine products, transportation, recreation, waste disposal, and production of energy, and the processes and conflicts that extend or limit these uses.

A surface ship in a seaway commonly has an order of magnitude greater power in its up-and-down motion than in its propulsion. This observation has led to the development by John Isaacs and David Castel of a new wave powered energy generator system with only one moving part powered by the relative motion between a long free-floating vertical pipe and the surrounding water. During that half of a wave cycle when the pipe is postively accelerated downward, water flows up through the pipe into an accumulator tank mounted on a surface buoy atop the pipe. A one-way check valve prevents the water from returning through the pipe during the second half of the wave cycle. The water is delivered at magnified pressures several times that of the wave height. When the trapped water then discharges through a turbine, it produces useful work.

Generators of this sort could be used as independent power sources for remote moored buoys and ultimately for non-polluting commercial power generation.

Although total wave power in the sea has been estimated at 3×10^{12} watts, a new analysis of the actual wave power extractable from the sea shows it to be an order to magnitude larger. This stems from the fact that the maximum growth rate of wave power occurs at the stage when waves are of about six seconds in period. Thus a number of the proposed wave-power devices can be more effective in harvesting the wave energy of, say, the trade winds than can a single station. The dimensions of the intake pipe are also much reduced by the shorter period, all of which increases the feasibility of ultimate large-scale development.

Tests with an 8"-diameter 200'-long model have yielded results that support the predictions of the mathematical model. The model's power-equivalent-output of 60 watts in the absence of a turbine would have resulted, after optimization of buoy and accumulator, in an output of ca. 600 watts. Based on this, a 3'-diameter 300'-long installation would produce about 20 kW of continuous power in the trade wind area.

Institute of Geophysics and Planetary Physics (Los Angeles)

The Institute of Geophysics and Planetary Physics is engaged in interdisciplinary programs related to studies of the interior of the earth, moon, and other planets, the fluid and gaseous parts of the planets, and interplanetary space. Major research programs being actively explored in the laboratories of the Institute include investigations into the origin of the magnetic field; the configuration of the earth's magnetic field in space, the earth-sun interaction; optical scattering in the atmosphere; the history of the solar system; astrophysical plasmas; ocean-atmosphere interactions; seismology; earthquake control and prediction; internal structure of the earth; earth tides; continental drift and plate tectonics; properties of materials under high pressures and temperatures; mineral synthesis; radiocarbon archaeology; geochronology; and man's interaction with his environment.

The impact of power production in the Lake Powell area on the economy of the Southwest was investigated using the Metzler Model of interregional trade. Secondary data (of the input-output variety), organized by regional industrial sector, are used in application of the model. The impacts demonstrated are regional change in gross national produce (GNP) and regional additions to employment. These impacts are generated by the initial changes in the pattern of trade occasioned by energy exports from the Lake Powell area, and the resulting regional expansion in energy-consuming activities.

According to results obtained from the model, the overall impact of current energy development in the Lake Powell area (using 1973 Glen Canyon figures and those projected for the Navajo Plant) is to generate a total increase in GNP of 1.25 billion dollars and an increase in employment of approximately 76,000 people. Of this overall increase in GNP, 47 percent goes to Arizona, reflecting the fact that this region contains the generating stations under analysis and obtains a large direct expenditure from them; 24 percent goes to the region "Rest of the United States" (excluding the Southwest), reflecting the importance of indirect expenditures resulting from interregional trade; 13 percent goes to California, a relatively closed and highly integrated economy with a large local multiplier; and 16 percent goes to the Southwestern states, Colorado, Nevada, New Mexico, and Utah, which are regions with large propensities to import.

Center for Latin American Studies (Los Angeles)

A multidiscipline research and study program in Latin American affairs, especially in the fields of social science, humanities, education, art, law, engineering, and public health. The Center has research facilities in several South American countries, and publishes a monograph series on Latin America, and other documents.

Research on Credentialization and Alternative Education in Latin America:

The major goal of this research is an examination of the "institutional space" available for education innovation in Venezuela. This space is recognized to bé dependent, among other factors, on the extent to which the non-pedagogical functions of schools, like selection and credentialization, have been institutionalized. Credentialization reduces the complexity of the allocation problem by giving certain individuals the exclusive right to compete for a range of positions. But when credentialization is strongly intertwined with the structure of work groups, it closes off the job market for competent but non-credentialed people.

The findings of this study suggest that nonformal and non-credentialed modes of education are unlikely to meet with much success in Venezuela. Educational planning in this, as in other nations, is shaped by a complex of ideological beliefs which stress the importance of formal education. This ideology, which the authors term credentialism, is characterized among other things, by a belief that continual education expansion and educational requirements for skilled work are essential to successful modernization. Such beliefs, when widely diffused throughout a society, are a potent-counterforce to educational innovation.

STATEWIDE AIR POLLUTION RESEARCH CENTER (RIVERSIDE)

The primary mission of the Statewide Air Pollution Research Center is to conduct relevant fundamental and applied, physical, and biological research on air pollution problems. The Center coordinates air pollution research on all campuses of the University. At UCR, emphasis is given to research on chemical and physical transformations of pollutants in simulated and ambient atmospheres; biological effects of toxic pollutants on plants; ecological effects studies; development and validation of models for chemical and physical processes and for impacts on plants. Existing research information is evaluated and translated into forms suitable for actual air pollution control programs. Finally, the Office of Technical Information at the Center provides assistance to faculty, students, legislators, pollution control agencies, industry, and the general public on scientific and technical matters related to air pollution and its effects.

Research has been undertaken to achieve a quantitative understanding of the aerosol component of Riverside smog as a prime example of photochemical reactions and how much is directly emitted by man-made or natural sources. The chemical nature of the processes which produce aerosol and the chemical done by comparing aerosols generated synthetically with those found in Riverside ambient air. Two major techniques will be used: (1) impaction followed by infrared and other types of analysis, and (2) particle sizing and counting using a light-scattering counter and pulse height analyzer.

In addition to degradation of visibility and soil-finding that sulfuric acid aerosol is formed by photooxidation reactions in air has important health implications. It is important not only to determine to what extent this process occurs in southern California air, but also to understand the factors which control the process and to develop methods which will permit assessment of its importance in other areas.

INSTITUTE OF TRANSPORTATION STUDIES (BERKELEY)

Established by the California Legislature. Conducts research and supports advanced study related to the planning, design, and operation of transportation systems. Research extends from materials and facilities to user behavior, systems analysis, safety, and economic and administrative problems.

Various aspects of short haul airline operating costs were recently investigated. The analysis of total operating costs for different airlines operating in short haul markets indicates that no significant savings, in terms of average total costs, can be accrued by increasing the scale of the operations. In other words, it is shown that no significant economies of scale exist in short haul systems.

The absence of scale economies in the operating costs of short haul airlines does not preclude the possibility that gains in level of service can be achieved when the volume levels increase. Indeed, an increase in service measured for instance by available seat miles, implies an increase in schedule frequency, and a decrease in expected passenger delays in the transportation system. Considerations of level of service such as increased frequency may be sufficient to encourage concentration of air transportation service, and the increase in volumes, even though operating cost characteristics do not.

It was concluded that a model of fares such as the one developed in this study, based on the operating cost functions of short haul airlines, is suitable for integration with demand models in order to provide a capability for estimating traffic volumes. All these models can be useful tools in decision making regarding the planning of short haul air transportation systems.

WATER RESOURCES CENTER (DAVIS)

The University-wide Water Resources Center is responsible for the development, coordination, funding, and dissemination of results from water-related research conducted on the several campuses of the University of California. The program involves members of faculty in teaching and research departments on the several campuses as "principal investigators," and usually the principal investigators assign graduate students to the projects. The Center's research program is relevant to the water-related needs of California and the nation, and contributes greatly to the graduate training educational function of the University.

What is the relationship of applied irrigation water to the production of calories and proteins in California--how efficient is a given amount of water in yielding food values for livestock and humans?

The conversion of such crops as cotton, tree fruits, nut crops and field corn into calories and proteins presented special problems, since only portions of these are edible and there were no satisfactory data measuring the inedible parts. The study therefore considered only the edible portions of these crops. Irrigated pasturage required a special conversion formula, since little has been published on the quantity of edible proteins and calories harvested from pasture land.

Computer print-outs have been completed which show the calories and proteins produced per acre-foot of irrigation water for each of the three study years (1964, 1969 and 1972) for the entire state and each county, and for all major crops.

A preliminary computer run for the whole state in 1972 indicates that California produced 45 billion megacalories. When compared to adult nutrient requirements, this suggests that California's irrigated agriculture without further expansion could feed the equivalent of about 50 million male adults, or more than one-fourth of the present U.S. population.

This finding and other results of the study are closely aligned with totals developed for other purposes in other related investigations.

Applications and findings resulting from this work should be of interest to California's agri-business complex, lending institutions, federal, state and local water developers-distributors, to agriculture and commerce agencies of the federal and state governments and to other researchers for further extension of the data.

Lick Observatory (Santa Cruz)

Research and instruction in astronomy, astrophysics, and varied programs for the study of the universe. Major research efforts have related to nearly every area of modern astronomical investigation including planets, satellites and comets, double stars, variable stars, gaseous nebulae, star clusters, the chemical constitution of stars, interstellar matter and its condensation into young stars, the motions of the stars, stellar structure, the nature, number and internal motions of galaxies, pulsars, X-ray sources, nuclei of galaxies, quasi-stellar galaxies.

A galaxy that is far more distant than any yet identified was discovered by a UC Berkeley astronomer at Lick Observatory.

Appearing only as a dim spot on a photograph, the giant galaxy containing thousands of billions of stars is calculated to be some eight billion light years from the earth. Its light has been travelling through space at nearly six trillion miles a year for a period of eight billion years -- or about half the total age that many astronomers set for the universe. The previous "most distant" galaxy, discovered 15 years ago, is about five billion light years away.

The new discovery marks an important advance in reaching outward in space and backward in time for knowledge of the evolution and structure of the universe. Known for 20 years as a powerful radio source in the sky, the galaxy now qualifies as the faintest object to be brought under optical observation and studied by spectroscopic techniques.

The finding, by Professor of Astronomy Hyron Spinrad, was possible only through a new technology that allows astronomers to "see" objects that are far fainter than the general background light of the night sky. Developed in recent years by UC Lick Observatory scientists Lloyd Robinson, E. Joseph Wampler, and Joseph Miller, the pioneering system, called an image tube scanner, makes it possible to store up spectroscopic data over several nights of observation and then factor out the effects of background light.

Professor Spinrad was able to measure the phenomenon known as "redshift" in light from the distant galaxy and then make calculations about its velocity, size, and distance. He discovered that the galaxy is five to ten times larger than our own Milky Way Galaxy.

The research has been supported by the National Science Foundation, which along with the National Aeronautics and Space Administration also helped fund the new instrumentation at Lick Observatory.

Institute of Geophysics and Planetary Physics (San Diego)

Research emphasis on the study of the earth's strain field by measurements of gravity, tilts, displacement, and longitudinal strain; of earthquake mechanisms; of normal modes of the earth; and of tides, waves, turbulence and circulation in the oceans.

A UC San Diego researcher and a graduate student have developed and successfully tested seismic monitoring capsules that can pinpoint for the first time mini-earthquakes in the sea.

Under a grant from the National Science Foundation, Dr. William A. Prothero, Jr., Assistant Research Physicist of the La Jolla Laboratories of the UC Institute for Geophysics and Planetary Physics at Scripps Institution of Oceanography, and Scripps graduate student Ian Reid conceived and designed the seismometer "pop-up" capsule.

The system uses three capsules placed in a triangular array so that earthquakes locations and depth can be computed by triangulation. The capsules fall freely to the ocean bottom, record as many as 1,000 quakes over a month's time, and then return to the surface to be recovered.

Scientists hope that increased knowledge of earthquakes in the ocean will lead to a better understanding of earthquakes on land. In addition, the new technology could be a useful tool for industry in making decisions about proposed sites for ocean operations.

Forest Products Laboratory (Berkeley)

Established by the California Legislature, this laboratory conducts research directed to the improved utilization of California tree species, including studies in wood anatomy, wood chemistry, wood physics, timber mechanics, and other fields of wood science and technology.

A UC Berkeley engineer has shown that changes in the design of circular saws and the way they are operated can save industry millions of dollars a year and significantly reduce waste of valuable materials.

Professor of Mechanical Engineering C.D. Mote, Jr., who began his research on saws as a graduate student at the UC Forest Products Laboratory in the early 1960s, has proven that blades can be made much thinner and, with control techniques, more stable than had been thought possible. His work was carried out as part of a University-industry cooperative effort, with a number of private companies providing financial support.

Dr. Mote designed electromagnetic controls that prevent saw blades from developing the erratic wobble that often damages the blade and causes product waste. Working with a colleague in Norway, Dr. Mote demonstrated that a blade did not have to be thick to be stable. The two reduced the cutting edge of a blade and, by using knowledge of the blade's operating characteristics, were able to predict when it would develop instability. They could then apply controls to prevent the vibrations from occurring.

According to the engineer, the combination of thinner cutting edges and more stable operation can save ten percent or more of the goods being cut, a significant factor in light of the increasing cost and scarcity of many materials.

SURVEY RESEARCH CENTER (BERKELEY)

A multi-disciplinary social science research unit focusing on survey research and related quantitative methods--a general mission implemented through three distinct but interlocking activities: a research program focusing on the utilization and development of the survey methods; a service unit that provides technical support to research projects outside the Center; and a laboratory for the methodological training of graduate students. Research projects include: political behavior, racial prejudice, higher education, civil liberties, religion and society, social indicators, the status of women, and consumer behavior, as well as studies in survey methods and data analysis procedures.

The hope that the next generation will be free from racial and religious bigotry was shattered by an SRC study that finds prejudice "rampant" among young people.

Also, schools ("more by default than by design") are doing little to combat prejudice, and in fact even appear unaware of its prevalence, according to the study.

The report contradicts many widely held assumptions, including the beliefs that contact between racial and religious groups always reduces prejudices, that prejudice is deeply rooted in the personality, and that prejudice can be reduced simply by teaching young people enlightened values.

They report that students generally finish high school with the same prejudices they had when they began. If there is any change, it is more often in the direction of greater prejudice and increased social distance.

Young people with the least education and affluence generally were found to have the strongest anti-Semitism and racial bigotry. An important exception was that black teenagers, although generally more deprived than white, revealed less prejudice against Jews.

The study is contained in a new book entitled Adolescent Prejudice. Published by Harper & Row, the book is the seventh volume in the Patterns of American Prejudice series, which has been developed at Berkeley with the aid of a grant from the Anti-Defamation League.

VIRUS LABORATORY (BERKELEY)

Research on the biochemical, biophysical, and biological properties of animal, bacterial, and plant viruses; the structure, function, and interactions of proteins and nucleic acids; in vitro mutagenesis; regulation of gene expression; cellular control mechanisms; cellular and cell-virus interactions and their relationship to cancer.

The precise "mapping" of a gene that enables a tumor-causing virus to turn cells cancerous has been accomplished by scientists at UC Berkeley. The researchers have also "mapped," or located, another gene that governs the formation of a protein envelope around the outside of each virus particle.

Their research findings mark a forward step in longterm scientific efforts to unravel the genetic code in viruses and to learn how the code is related to cancer and many other viral functions. Such complete knowledge is still many steps away, but scientists believe it is increasingly within reach and could some day show the way toward powerful new weapons in the fight against cancer and other diseases.

The research at the UC Berkeley Virus Laboratory was conducted by Peter H. Duesberg, Professor of Molecular Biology; Lu-Hai Wang, a graduate student; and Karen Beemon, a postdoctoral virologist. Their work is supported by grant and contract funds from the National Cancer Institute of the U.S. Public Health Service.

Their achievement was the first such gene mapping in a virus that causes naturally occurring forms of animal cancer. A key material used in much of the research was a strain of Rous carcoma virus, which causes tumors in chickens. The Rous virus, discovered about 60 years ago, was the first virus identified as carcinogenic. The two genes mapped by the UC group are chemical sequences of the RNA molecule.

In the Rous carcoma virus, as with all cancer-causing viruses, a single gene's function is sufficient to transform a normal cell to malignancy. In order to discover how a virus causes cancer, scientists must first locate the gene responsible for that function on the RNA molecule and then learn how it carries the message to cause cancer.

Marine Science Institute (Santa Barbara)

The Institute serves to promote and facilitate interdepartmental research in coastal zone studies. Faculty and students from Anthropology, Biological Sciences, Economics, Engineering, Computer Science, Geography, Geological Sciences, Political Science, and Physics participate in programs administered by the Institute. Much of this research is focused on the local coastal zone -- its characteristics, resources, present and anticipated uses, and the effects of pollution and development. The Institute provides the focus for: interdisciplinary research in coastal oceanography; socio-economic-political-cultural issues in the coastal zone; environmental baseline; and mariculture. It also engages in other public service activities related to marine science.

A study of seaweed resources has been undertaken to provide a combination of biological and economic information which would form the basis for intelligent management of the economically important seaweed species harvested in California. The final product of the research will be a publication which would provide some suggestions as to how these resources might be intelligently managed and protected. Studies have been completed on the giant kelp Macrocystis, agar weed (Gelidium) and nori (Porphyra), as well as having examined several other seaweeds (Laminaria, Gracilaria, and Eucheuma) in a preliminary way.

Hooper Foundation (San Francisco)

The Hooper Foundation conducts epidemiological research programs specializing in human ecology and international health, with special reference to parasitic and infectious disease, population genetics, cancer epidemiology, medical anthropology, and sociocultural aspects of health.

Ongoing research is concerned with the genetic epidemiology and interacting environmental factors in the natural history of cancer. The specific aims are: 1) to search for possible associations between specific genetic markers (single or multiple) and susceptibility to specific types of cancer. If such associations can be found, they will be investigated further for their value in the detection of high risk individuals as well as for their potential role in etiology; 2) to investigate the relative contribution of genetic, anthropological, and sociological techniques. These include genetic distance estimates, genetic admixture estimates of racially-hybrid populations, and other indices of physical anthropology and medical sociology; 3) to study the biology (biochemistry, virology, cytology and physiology) of aspirated breast fluid and its potential value for the determination of susceptibility to breast cancer; 4) to investigate personality and psychological attributes which may predispose to cancer susceptibility.

Institute of Governmental Affairs (Davis)

A research facility which investigates policy-oriented questions, especially those related to the impact of law and public policy on the society and the State of California. Research programs concentrate upon environmental decision-making, local government, public finance, and state problems.

Two separate studies of the impact of federal revenue sharing on community-level political and decision processes continued during the year. One involved the collaboration of Professor Dale Rogers Marshall of the UCD Department of Political Science with two political scientists at San Francisco State University on an investigation of revenue sharing and model cities' programs in 10 Bay Area cities. The other involved the collaboration of Professor Alvin D. Sokolow with two UCD agricultural economists on a study of revenue-sharing implementation in five largely rural counties in northern California.

INSTITUTE OF HUMAN LEARNING (BERKELEY)

Research emphasizes the basic principles of human learning and the application of these principles to such areas as education, language development, learning ability, and information processing.

Second-language learning is being studied in a small sample of Japanese children 5-15 years old who have been in the United States a year or less. The purpose of this work is to compare second-language acquisition to what is known about mother-tongue acquisition in English. Earlier work by Ervin-Tripp and others had shown some similarities in acquisition process and structures when the languages were similar in structure, but these findings left ambiguous whether the child was recapitulating acquisition or regressing to earlier strategies already known through mother-tongue acquisition. Hence the choice of Japanese, in which the syntax is radically different from English. In addition, the wide age range was intended to include post-pubertal subjects for whom either biological or social conditions of learning might be different. The structures which are being tested are word-order strategies for comprehension in both languages, inflectional acquisition of number, gender, and case in English pronouns, auxiliary structure, topic identification, and some discourse agreement.

Institute of Business and Economic Research (Berkeley)

Research and publication on problems of economics and business with an emphasis on problems of particular importance to California and the Pacific Coast.

A one-year grant from the Social Sciences Division of the National Science Foundation will enable Hayne E. Leland to undertake research in Economic Analysis of Alternative Leasing Policies for Oil and Gas. This study began in April 1975 and is therefore only in its earliest stages at this time. The project will study alternative methods of leasing government land, for oil and gas exploration, development, and production, and the impact of risk-sharing on lessor and lessee and the decisions of private firms. Some of the aspects to be examined include amounts bid, the extent of exploration, the speed of development, and the ultimate recovery of natural resources. Government leasing policies to be explored include bonus vs. royalty bidding, profit sharing and "oil pledge" requirements, and open vs. sealed bidding.

Earthquake Engineering Research Center (Berkeley)

Conducts research and public service programs which will ultimately aid in the prevention of loss of life and property damages resulting from future strong motion earthquakes. These programs place major emphasis on (1) predicting the characteristics and intensities of strong ground motions caused by earthquakes, (2) predicting their potential damage effects on existing structural, mechanical, and soil systems, (3) improving seismic resistant devices, and (4) collecting and disseminating information on earthquake engineering. The Center operates an earthquake simulator facility and extensive dynamic structures test-facilities to evaluate the earthquake resistance of typical building construction.

The principal objective of a study on the safety of school buildings is to develop guidelines for rehabilitation and reinforcement of existing school buildings for safe earthquake performance. Various types of school buildings and typical deficiencies in their earthquake safety are identified and current criteria used in condemning school buildings reviewed. Typical architectural and structural modifications in existing buildings to ensure adequate earthquake safety are investigated and new techniques are explored. Also, typical condemned buildings which do not meet the current standards are selected and various means of rehabilitating and reinforcing these buildings to bring them up to a safe standard will be investigated.

In compliance with recent legislation, many pre-1933 (Field Act) California schools have been examined and are now in the process of rehabilitation or demolition. Safety of post-1933 schools has not been explored as fully, and the intent of this study is to focus attention on these.

Institute of Governmental Studies (Berkeley)

Conducts programs of research and service designed to increase understanding of American governmental instituions, politics, and public policy issues, with a specialized emphasis on urban, metropolitan, and state problems. The Institute administers a major specialized library, publishes monographs, serials and papers, conducts seminars and conferences, and provides informational services.

A project on charting public attitudes in California toward a number of future-oriented technologies as well as more general perceptions of science and technology is sponsored jointly by the National Aeronautics and Space Administration and the National Science Foundation.

Field interviews in 1972 and 1974 provided information related to patterns of change and/or crystallization in attitudes toward technology. The research will seek to define to some extent the political context of public support for large-scale technology.

Institute of Personality Assessment and Research (Berkeley)

A research facility with two related objectives: (1) the development of techniques and procedures for the assessment of human functioning, and (2) the utilization of assessment procedures and multivariate methods to discover the characteristics of individuals who are particularly effective in their personal or professional lives, the life histories and experiential backgrounds of such individuals, their role in our society, and the strategies they employ to cope with critical incidents in the life cycle; and ways and means by which an individual's psychological effectiveness may be enhanced.

Work on the study of critics, editors and gate-keepers in children's literature, which has been funded by the National Endowment for the Humanities was continued during 1975. Analysis of writings of 76 critics promises to show six "types" of critic: the watch-dog or defender, the challenger (dragon-slayer) or skeptic, the expert witness or member of the club, the elucidator, and the door-opener. Critics who take each of these roles express in their writings characteristic concerns and features of style. Information about personality, work attitudes and background have been obtained from more than 70 percent of the authors of these articles, and relationships between these various sets of variables are being explored.

Institute of Industrial Relations (Berkeley)

The Institute is concerned with three principal activities: (1) an interdisciplinary research and publishing program currently directed toward the study of labor-management relations; wages and related problems; economic security programs; social and industrial psychology; occupational health and safety; manpower training; employment and unemployment; minority relations, and public employee bargaining. (2) Research training and financial support of graduate students as research assistants. (3) A set of educational and related research activities in industrial relations for groups of trade unionists, industrial managers, and the general public, including labor and urban studies, labor occupational health, California public employee relations, and a worker exchange program.

The difficulty experienced in restraining inflation at high levels of unemployment has led to a renewal of interest in unemployment insurance as a device designed to maintain incomes. Professor Clair Vickery (Economics) has developed a research project on Unemployment Insurance (UI) in the U.S. Her project consists of three parts. The first, a comprehensive view of the national UI program, will emphasize the impact of the program (through taxes and benefits) on income distribution and unemployment across states and during various stages of the business cycle. Secondly, a micro simulation for California will be developed. Using micro data collected by the government (especially the continuous work and benefit history file), she will estimate the relationships of layoffs, quits, hiring, and labor force participation over the cycle. The functional forms will be used to construct a simulation of the California labor market in order to shed light on the influence of the present UI system on labor market behavior and to estimate the impact of proposed changes. In the last part of the project, she will develop a macro simulation by states to make crude projections of the impact of changing (through Federal law) the UI system on observed labor market behavior and to estimate the cost of such changes. The sensitivity of the spells and duration of covered unemployment to key aspects of state UI laws will be estimated.

Space Sciences Laboratory (Berkeley)

A multidisciplinary laboratory engaged in basic and applied research and supporting advanced study in the physical, engineering, biological, environmental, and social sciences on problems relating to the exploration of space or using technology developed in space research. Basic research programs include cosmic ray and high energy astrophysics; X-ray, EUV, and infrared astronomy; in the area of space plasma physics, satellite programs to study the sun, the interplanetary medium, and magnetized planetary bodies are being worked out; work is also done in exobiology and molecular evolution; some lunar sample studies continue. Current applied and public service research includes remote sensing techniques applied to earth resources problems; sociological and economic studies of public policy questions related to the environment and earth resources utilization; the mass spectrometry and gas chromatography facilities are used for biomedical and environmental applications in situations where extremely small concentrations of complex organic materials are important.

Three UC projects, two from Berkeley and one from UCLA, were aboard the historic July, 1975 Apollo-Soyuz mission, the first manned space link-up between the U.S. and the Soviet Union.

The two Berkeley astronomy projects received more than $1.6 million in funding from NASA and were given first and second priorities among the 27 projects chosen for the mission.

The first experiment used a telescope to scan Jupiter and 34 selected stars as possible sources of extreme ultraviolet radiation. Many scientists believe stars do not radiate extreme ultraviolet rays, or even if they do, that the radiation cannot be detected. If the UC scientists are successful, they will disprove these theories and open a new field of astronomy.

The second project, called a Helium Glow Experiment, examined the nature of the gases between the stars, the vaporous, thin substance from which stars are born and into which many of them vanish when they die. The researchers hope to learn the temperature, density, and motion relative to the earth of the interstallar gases.

Principal investigator, Stuart Bowyer, Associate Professor of Astronomy, spent more than two years designing and testing the projects with co-investigators Michael Lampton and Francesco Paresce of the UC Berkeley Space Sciences Laboratory.

As a result of the UCLA research, the American and Russian astronauts will "manufacture" a space-made produce that could drastically change man's communications on earth.

Aboard the spacecraft will be a small electric furnace in which elements will be fused to produce optical fibers with qualities that cannot be duplicated on earth because of gravity. The space-grown optical fibers, which will retain their characteristics on earth, can transmit light and information from one end of the fiber to the other, in the manner of optical wave-guides.

The scientists believe that eventually these fibers could become integral parts of many communication devices, promising faster and clearer transmission for computers and telephones and higher resolution for television pictures at considerable economic savings.

The UCLA experiment was developed over the past three years by Engineering Professors Albert S. Yue and Cavour W. Yeh.

Agricultural Experiment Station (Systemwide)

The statewide Experiment Station is the research arm of the University's Division of Agricultural Sciences. Its research activities are conducted at campus, field station, and experimental areas. They are an integral part of the teaching programs on the Berkeley, Davis, and Riverside campuses, and the source of new knowledge for application to the solution of agricultural, resource, and environmental problems of California. The research programs are concerned with the conservation and use of natural resources, environmental enhancement, the efficient production of farm and forest products, product improvement and marketing, protection of plants and animals, family and consumer welfare, community and economic development.

Research is being done on the optimal use of drip irrigation as a means of greatly reducing the requirements for water in irrigated agriculture. Related work involves the effect of this method on plant nutrient availability and plant nutrient availability and plant growth.

Studies are in progress on the mobility, degradation and ultimate fate of herbicides in soil-water systems, on the relationship of irrigation return flow as a source of river pollution, and on the effects of air pollution on the forest ecosystem.

Increased efficiency is being sought through work on the achievement of multiple births in livestock through hormonal control of reproductive processes; the improvement of nitrogen fixation in soybean plants (which would have the additional benefit of reducing the demand for nitrogen fertilizer, and hence reduce the pressure on natural gas supplies); the reclamation of straw and other cellulosic materials as feed for sheep and cattle; and through study of the effects of various environmental factors on light utilization by plants.

Overall improvement in the nutritional quality of foods and in the efficiency of the agricultural production, marketing and distribution system is being sought through studies of means to reduce post-harvest deterioration of fruits, vegetables and other food and fiber products. Wine aging processes are under study for the development of methods of rapidly improving the quality of young wines.

Basic and applied research is being done on the reduction of plant susceptibility to virus diseases, the safe use of chemicals to control nemotodes, the management of arthropod pests in grapes, the identification and introduction of biological pest control organisms, and the integration and optimization of pest management systems. Similar work is being done on the use of insect popu-

lation monitoring techniques to reduce the use of chemical controls in the production of pears, other tree fruits and field crops.

Studies are being conducted in labor-management relations in agriculture and in the use of coordinated vocational training of agricultural workers to improve the individual's qualifications for higher-level employment. Other work involves research on the organizational structure and operating policies of farm production cooperatives composed of low-income farmers. Studies are being made of the establishment of community data systems for use in planning and decision making.

Appendix 3
Testimony of Chet O. McCorkle, Vice President,
The University of California
before the Education Subcommittee
of the Assembly Ways and Means Committee
California Legislature 1976 Session
Concerning: Enrollment Levels for the
University of California in 1976-77

Mr. Chairman, it is evident to all that the University has not yet provided a statement of the basis for its enrollment projections for 1976-77 which the subcommittee finds either clear or persuasive. I am convinced that this unfortunate circumstance is primarily a result of a series of misunderstandings and not of major substantive differences. I would like to try to clear up this important matter and to dispel the confusion that surrounds it.

Let me begin by explaining that, as part of our regular ongoing planning and budgetary process, we estimate expected enrollments several years into the future. The product of this process is our long-term enrollment plan. The last such plan was approved in 1974 and was based on the best data we had on projected population in the 18 to 24 year old category, trends in participation rates and other key factors. The numbers in the 1974 plan are, indeed, estimates requiring later adjustment as new facts are perceived and become known. However, we do not adjust our long-term enrollment targets, unless we judge a change in direction or rate of growth to have a long-term effect. With this in mind, let me begin by clarifying how our final 1976-77 budget request to the Governor was developed:

- In November, 1975, we submitted the original Regents' 1976-77 budget request to the Governor. Where enrollment related, this budget request was based on our 1974 long-term projections for the 1976-77 budget year.

- Shortly thereafter, the Fall 1975 student census was completed. This showed that we had an exceptionally large over-enrollment which would likely carry forward into 1976-77. The over-enrollment was caused by several factors. The two primary factors were more continuing students than anticipated, and an increase in the number of students enrolling of those whose applications were approved. On hindsight, some admissions offices made errors in the numbers admitted and in setting closing dates on acceptance and applications. Past experience did not provide correct guidance in a new situation. Over-enrollment of 3266[1] students beyond our planned level resulted.

- We immediately forwarded an amendment to our 1976-77 budget request to the Governor, in line with established procedure, asking that the enrollment estimate be increased from the 106,987 students in the original Regents' budget, to a new total general campus student population of 109,173.

- Because we judged the over-enrollment to be a temporary "bulge" which will work through the system in a few years, we requested temporary resources to fund this additional enrollment. At the same time, we launched

1) All enrollment numbers used in this paper are General Campus, excluding Extended University, year average FTE.

an internal enrollment planning review with the campuses to determine if we could, without penalizing this year's entering freshman class, return to our established enrollment plan by 1978-79. The decision was made to do so and was fully consistent with our assumption that the bulge would probably be a short-lived phenomenon.

On December 2 we had our annual budget discussion with the Governor. This discussion centered on whether the University had too many students to maintain quality. Three concerns on the part of the Governor emerged from that discussion. (1) Was the University taking more students than were really qualified because the State was providing resources for enrollment increases?; (2) Had the eligibility pool increased as a result of high school grade inflation and therefore had the University's average quality declined?; and (3) Were the University graduate programs as productive and efficient as they could be without sacrificing quality?

We explained that we, too, were concerned about the eligibility pool and had already submitted information to the California Postsecondary Education Commission staff to assist in the review of the status of the eligibility pool and that we were reviewing policy options to increase the productivity of our graduate programs. We explained that we were certainly not admitting students for the sake of acquiring additional resources, given the level of resources we were receiving at the margin. We further explained that correction of the eligibility pool and graduate productivity changes would take at least two years to accomplish and therefore would not affect 1976-77 student numbers. And we agreed to review with the campuses the possibility that we were admitting students that were not fully prepared for study at the University.

Thus two themes developed in the debate that has carried forward since -- one related to the quality of our students and the other related to the quality of their educational experience as affected by the resources available to the University. At one point in the debate the Governor linked the two by suggesting that perhaps one way to enhance the quality of the educational experience was to take fewer and higher quality students and spread the resources over fewer students. The Governor did not discuss 1976-77 budget dollars in this context. Therefore, we did not expect that the Governor would decide in the budget which he submitted to the Legislature on January 16, 1976, to fund only the 106,987 students rather than the amended number of 109,173. Nor did we expect the Governor to eliminate section 28.9 from the proposed 76-77 Budget Act. As you know, that section expresses in precise terms the policy of providing resources necessary to fund unanticipated over-enrollments. By those two decisions -- one, not to fund our revised 1976-77 higher enrollment budget request, and two, eliminating section 28.9 -- the Governor clearly opened the public policy issue of access to the University.

These two decisions complicated substantially the University's assessment of what resources would likely be available for fiscal 1976-77. The Governor's veto power over any line item in the Budget Act is a reality which we must accept in our planning. Therefore, in making our final 1976-77 enrollment decisions, we could not ignore the likely resource outcome and, since the University no longer had the resource flexibility to accommodate unfunded enrollments, we felt it prudent to act in a way that would minimize any further degradation in the quality of education being offered to our students. This has been a continuing and overriding concern, particularly on those campuses which have been pushed above their planned capacities and where we have been able to reduce those enrollments in a reasonable time. We still place high priority on returning to these ceilings as soon as we can.

Our request to the campuses to re-estimate their 1976-77 enrollments (in line with our determination to protect academic quality) resulted in a decrease in unfunded enrollments from 2186 to the 1014 in our augmentation request and resulted in enrollment levels still much higher but more nearly in line with our approved enrollment plan. Enrollment ceilings in the University are not new. For instance, even before we talked to the Governor on December 2 and well before the Governor made his budget decisions in January, the Berkeley, Los Angeles and Davis campuses, which have 60% of our student capacity, were already oversubscribed and had stopped admitting additional undergraduate students at almost all levels in order to meet the objectives of our long-term enrollment plan for those campuses.

All of these steps, we judged, were in keeping with the University's present policy of admitting all qualified California high school graduates at some campus. It is our responsibility to admit those of the top 12-1/2% who apply. The 12-1/2% pool we believe may have expanded some due to grade inflation. And we may be admitting a small number who are actually unqualified by that standard. We are currently studying both of these questions, but they are separable issues. Our preference continues to be to admit all qualified students to their campus of first choice -- within capacity limits. But we are most reluctant to do so without the necessary resources. Obviously, no one is well served if the quality of education falls for all. We requested the resources we needed in our revised budget of December 2, but we are well aware of the fact that positive action by both the Governor and the Legislature is necessary.

Our basic resources problem has been accumulating for the past several years. Many of you will remember that during the later part of the explosive growth period of the 1960's, resources available to the University were not increased in proportion to the very rapid increase in the number of students. Rather, these resources were slowly but steadily eroded. In terms of constant dollars, the actual instructional resources available per student have decreased by 25% since 1966. During this period, we continued to admit all qualified students eligible to enter under the access policies of the Master Plan for Higher Education. But this was achieved at a substantial cost which took such forms as:

- Not being able to maintain a reasonably flexible mix of class sizes which would permit the desired level of student-faculty contact during a student's undergraduate career.

- A steadily declining student faculty ratio, especially at Berkeley and LA in favor of providing faculty -- but in insufficient numbers -- for the newer campuses.

- A declining instructional equipment component per student and a rapid increase in reliance on obsolete instructional equipment.

- Not being able to maintain an attractive and effective learning environment.

- Not being able to maintain facilities in good repair.

Therefore, for all of these reasons, we concluded that to accept additional unfunded students in 1976-77 would so erode the quality of education as to be unacceptable to the University and, we believe, the people of California.

Everything considered, we reluctantly concluded that the only responsible course of action was to return as quickly as possible to our established enrollment plan. We attempted to manage enrollments while we still had the opportunity in order to match as best we could the enrollment to the resources the Governor indicated in his budget he was willing to make available.

Since it would be impossible to return immediately to the 106,987 level the Governor's budget proposes to fund, we are asking this Committee and its counterpart in the Senate: 1) to provide temporary funding to support adequately the 108,001 students we expect to enroll in 1976-77, and 2) to restore section 28.9 to the Budget Act. If we have another unexpected enrollment "bulge" next year, we want to admit the students but additional resources will be needed.

I have indicated the facts and circumstances as we perceive them and traced our reasoning for you. We knew when we made the decisions we did that they would be difficult to explain and unpopular. Yet in good conscience we did what we felt prudence dictated, albeit with substantial reluctance and misgivings.

I do not expect that this clarification will necessarily make our decision more acceptable. I only hope our reasoning is understood better.

TEJ/COM/DSS
4/7/76